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THE PRACTICAL TEACHER

Mrs. HUMPHRY WARD.
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VOL. XXVII No. 8

EDITORIAL, PUBLISHING AND ADVERTISING OFFICES OF "THE PRACTICAL TEACHER"
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THE
PRACTICAL TEACHER
A MONTHLY MAGAZINE AND REVIEW
FOR THE SCHOOL-ROOM AND THE STUDY

Vol. XXVII. No. 8. FEBRUARY, 1907. Price 6d.

NOTICES TO CORRESPONDENTS AND SUBSCRIBERS.

"The Practical Teacher" may be ordered of any Newsagent or Bookseller, or at any Bookstall, in the United Kingdom or in the Colonies. Supplies are sent monthly to the chief towns in Australasia, South Africa, and India.

London Office: 35 and 36 Paternoster Row.
Edinburgh Office: Parkside Works.
Dublin Office: 17 Talbot Street.
New York Office: 37 East 18th Street.
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Subscribers may obtain "The Practical Teacher," post free, from the Publishers at the following terms:—

United Kingdom, Continent, Colonies, and United States } 12 Months, 8/- 6 Months, 4/-

All literary communications should be addressed to the Editor, Office of "The Practical Teacher," 35 and 36 Paternoster Row, London, E.C.

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ABOUT OURSELVES.

FOR a period of more than a quarter of a century *The Practical Teacher* has endeavoured to keep its readers in the van of educational progress. That the efforts of its numerous and distinguished contributors have been duly recognised and appreciated the wide circulation of the paper has conclusively proved. Wherever English-speaking teachers forgather, *The Practical Teacher* is known and regarded as a real helper in the work of the profession. We shall not deny, however, that there are teachers who are not yet numbered among its readers. In order to induce them to become regular supporters of the magazine, we are arranging for several new and attractive features which will, we trust, help to make *The Practical Teacher* indispensable to the up-to-date educationist.

Teachers who study carefully the educational tendencies of the present time are aware that, in dealing with each of the ordinary school subjects, there is now a definite endeavour to connect the work with the everyday life of the pupil. In order to help the teacher to impart this element of realistic interest to his work, we have arranged for a special monthly contribution, entitled "The Modern World," the first instalment of which will be found on pages 397–402. This, we earnestly hope, will prove useful not only to the class teacher, but also to those examination students who will be called upon to work a paper on up-to-date general knowledge.

All teachers who work under the direction of the Board of Education are familiar with the circulars and Blue Books of "suggestions," which partake somewhat of the nature of a royal invitation. In common with most unofficial educationists, we find in these "suggestions" much that is helpful and stimulating; and we propose, in the immediate future, to make them the basis of a number of articles, the object of which will be to demonstrate how far these "suggestions" can be adopted under present conditions. Our contributors will not hesitate to differ occasionally from the official pronouncements, but our readers may rest assured that, even when an article is unsigned, as may occasionally occur, they are reading the opinions of a tried and trusted educationist. In the present number we offer a paper on "The Backbone of the Primary Curriculum," and one on "The Use of the Literary Extract."

For a long period our "Tutorial Section" has been found exceedingly helpful by student teachers, but the growth of correspondence tuition and the general establishment of pupil-teacher centres has diminished the need for the particular kind of assistance we have been accustomed to offer. Times have changed, and we intend to change with them. At present we are making arrangements for supplementing the work of the private or correspondence tutor, and hope, in the immediate future, to reorganise this section of *The Practical Teacher* in such a way that it will not only be helpful to the student, but also provide interesting and profitable reading for the working teacher.

Acting upon a hint supplied by Professor Sadler at the meeting of the British Association in August last, the Editor has also determined to set apart a special section of the paper for succinct accounts of educational experiments in primary and secondary schools. The first papers in this section will appear next month, and every effort will be made to keep the readers of *The Practical Teacher* acquainted with all the most interesting new departures in school method.

Other new features we hope to announce at an early date. The Editor would be much obliged if subscribers would favour him, at any time, with suggestions for increasing the usefulness of *The Practical Teacher* in any way. He will also be glad to consider articles of practical interest on educational work in either primary or secondary schools.

EDUCATIONAL OPINION

IN WHITEHALL.

THE centre of gravity shifts from the Palace of Westminster to the Treasury Buildings in Whitehall—the Treasury Buildings that house the Exchequer and the Board of Education—the taxer and the spender—side by side. For a while there is no question of education in Parliament. The Education Bill died and was buried before Christmas. For the time the centre of educational gravity lies in Whitehall.

What will they do in Whitehall? Will the taxer find money to build council schools by the thousand? Will the spender so alter the Code as to damage the voluntary schools? What will they do in Whitehall?

What will they do in Whitehall? That is a question which peers and bishops put to themselves sometimes, when uneasily they think of the dead Bill, its summary burial, the shouts about it, and the lament for it uttered even in the King's speech from the throne! Opposite the Treasury Buildings there is another great old edifice in Whitehall. Inigo Jones erected it to be the banqueting-hall of the Stuarts. The Stuarts killed Bills. There has been no banqueting in that palladian edifice since out of its middle window, on to a black scaffold, one winter day, went Charles the First. Liberals and Nonconformists, as they go up Whitehall, look at that middle window, and think of a scaffold for the Peers, a block and an axe for the principle of hereditary right in Parliament. Then they look across to the Treasury Buildings, the Exchequer, the Board of Education, and again the question is put, What will they do in Whitehall? That is what teachers by the thousand in voluntary schools began to wonder when they read that the Bill was dead and the Government was vowing vengeance. What will they do in Whitehall?

The Board of Education—the house and shell of it, that is—does not look as if it were going to do anything much. Stolid it stands, its dull windows gazing out upon Parliament Street sleepily, like lack-lustre eyes. The Board of Education is tired; the Board of Education has had a terrible time of it these last ten years; the Board of Education does not want the bother of another Education Bill just yet. Two great Bills dead in ten years are quite enough for the Board of Education, not to mention the Act—*the* Act, the Act of 1902—and all the trouble and labour it has entailed—trouble and labour before it was passed, trouble and labour ever since. The Board of Education would be glad to be let alone for a year or two to recuperate and snooze.

But the Liberals and the Nonconformists, the Free-Church Councils and the Passive Resisters, will not hear of that; they are carving out fresh trouble and labour for Whitehall. Homer might nod by a Greek fire occasionally, but he was soon prodded awake again and made to utter long screeds of the *Iliad*, poor old fellow! And the Board of Education had better slumber while it may, for it is not to be allowed to slumber long. Those confounded Passive Resisters (the fanatics!) are at it again; the fire-eating Welsh (the Taffies!) are blustering and flustering; the Government (vulgar Burnses and such!) are demanding memoranda and other nuisances of papers as to what Whitehall can do to "put the fear of God into the Lords" and make them wish they hadn't! So says the Board of Education to itself. No lasting peace, no sufficient snoozing for Whitehall.

There is a certain member of Parliament called Massie—Professor Massie, even—who is a Nonconformist and a Liberal, and the treasurer of the Passive Resisters, and what not that is subversive and uncomfortable and anti-somnolent, who has been telling the public who sympathise with his policy what they are to demand from Whitehall. The Act of 1902 is to be worked stringently, to the betterment of education and the downfall of the voluntary schools. Something of what he suggests is sure to have to be done by Whitehall. Prescient bishops have begun to shiver already. Two of them issued a Christmas appeal—not for Christmas dinners for the needy, or Christmas toys for bedridden children, or blankets and coats for shivering old folk—no; for £50,000 to spend on the fabrics of London voluntary schools. For the London County Council will now come down on the London voluntary schools very heavily, the Bishops fear, unless a majority of Churchmen can be elected on the Council next March.

"No more eight square feet basis!" says Professor Massie, and he is positively the mildest of all the Nonconformist M.P.'s. No more eight square feet basis! Yes, Whitehall can enact that in the Code, if it chooses, without requiring the assent of the bench of Bishops and the other Lords. That will mean a reduction by one-fifth of the accommodation in voluntary schools. That will mean one-fifth less in the teachers' shares of the grants. Oho! two merry blows at the voluntary schools, their teachers (who wanted to "volunteer"), the Bishops, and the House of Lords!

But will the Local Education Authorities like that? questions the wise, reflective man, who knows that the argument of the pocket in this country is stronger than political feeling, or than even the *odium theologicum* itself. "If schools have to be measured down, attendances decreased, grants diminished, and schools without proper playgrounds ruled out altogether, in the interests of the children" (for health's sake), "it can't be helped," Professor Massie writes. "But what about the drain on the rates to make up for all this?" asks John Bull. "Didn't the Government promise a million to pay in rent to the transferred schools?" asks Professor Massie—if they *were* transferred. Very well, then. Let the Exchequer arrange for the division of the million, to be interest and sinking fund for a capitalised sum of some thirty millions lent to the Local Authorities for the building of new council schools. Administrate the voluntary schools out of existence, since the Lords won't

BRITISH MUSEUM

let them be transferred. And at this suggestion the Exchequer wakes up, in Whitehall.

The Exchequer is now Mr. Asquith, and Mr. Asquith is an ill man to flout. Mr. Asquith, Chancellor of the Exchequer, will have a big surplus to dispose of when he comes to make his Budget proposals next April. Mr. Asquith can provide new educational grants for building new schools to replace the old ones—the voluntary ones. These grants can perhaps be specified in the Finance Bill; and the House of Lords cannot kill a Finance Bill, or even "amend" it. Or, if the grants cannot be specified in the Finance Bill, they can in next year's Day School Code. The Code must lie on the table of each House of Parliament a month before becoming law, and becomes law unless a "humble address to his Majesty" against it is carried in both Houses of Parliament. A "humble address" from the House of Lords seems a contradiction in terms, and could have no effect unless the Government assented to it, or the King intervened. By grants and Codes Whitehall could do a great deal to "make the Lords wish they hadn't." But Whitehall is counting on the Lords wishing something else.

Whitehall is excogitating a Bill to reverse the effect of the House of Lords judgment in the West Riding appeal—a short Bill, forbidding the payment, out of rates or taxes, of any sum payable in respect of denominational religious teaching in a public elementary or secondary school. After the perfervid declarations in the House of Lords last year that the Lords accepted the principle that the Churches must pay for Church teaching, the Lords could hardly reject such a Bill as that, it is thought in Whitehall. And here there is room for teachers in voluntary schools to excogitate. For what will such a Bill, if it becomes an Act, produce in the matter of voluntary teachers' salaries? A deduction from the stipend payable now by the Local Education Authority? If so, a sum raised by the managers to make up for the loss? *Will* the managers raise such a sum? And if they do, will not the teachers be more than ever the servants of the foundation managers, forsooth?

But suppose the House of Lords refuses to accept a Bill which definitely removes the cost of denominational teaching from the rates, even if that Bill leaves the management of voluntary schools and the managers' right to appoint teachers for denominational reasons untouched. What then? What would happen then? Almost certainly an immense and general outbreak of passive resistance by Nonconformist ratepayers would happen. Almost certainly those education committees and borough councils which are manned by a majority of Liberals, Labour men, and Nonconformists would refuse to pay, and drive the Government to mandamus them. And then, almost certainly, also, passive resistance would flare up on the other side. High Anglicans and Roman Catholics would refuse to pay rates towards the cost of what is elegantly called Cowper-Templeism, and, equally with the Nonconformists, for conscience' sake. "What a nuisance consciences are!" thinks Whitehall.

Cowper-Templeism!—as much an "ism" as was Jansenism, and Calvinism, and Methodism, and each of the other theological "isms;" and as dangerous—more dangerous, indeed—to the crystallised and Established Churches—that is, the most powerful "isms." In theory Cowper-Templeism is the omission of all dogmas that all Christians do not hold in common—a dangerous "ism" this to Churches which each suppose themselves to be the one and only repository of complete Christian truth. As Cowper-Templeism spreads, it saps the ecclesiastical foundations (not the *Christian* foundations, notice!) of those other "isms"—Anglicanism and Romanism, etc. And can it be expected that High Anglicans and Roman Catholics will pay rates for the teaching of this antagonistic "ism," when rates for the teaching of Anglicanism and Romanism are denied? No, *they* will passively resist; and passive resistance on a grand scale will be as irresistible as was the Russian national strike in its day.

Behold, then, the prospect for Whitehall—the elementary schools department of Whitehall. But the other departments are not any happier in their minds. The secondary schools department and the training of teachers department see trouble ahead. Labour members and trade unions (the vulgar tub-thumpers!), the National Union of Teachers (pestilent combination of the vulgarly educated!), and the Association of Education Committees (fussy Bumbles!) are preparing to make things warm for the secondary schools department and the training of teachers department at Whitehall. The teachers' register, elaborately planned and partly built on two columns, A and B, is done for; the report on higher elementary schools and the Consultative Committee who concocted it are becoming a byword and a scoff; the training of pupil teachers in special classes at grammar schools is working so badly that even its devisers allow that it is breaking down; and the transformation of higher-grade board schools (vulgar modern things!) into respectable tony halls of Attic learning, such as those which educated the permanent staff at Whitehall into such conspicuous examples of culture and ability, is refusing to carry itself out. It is quite within the bounds of possibility that a battalion of training college students, officered by principals, vice-principals, tutors, and the drill-sergeants, may lay siege to Whitehall with cries of "Allow us to sit for our matric., our intermediate, our B.A., our B.Sc.!" Lively times ahead for the non-elementary departments at Whitehall!

Yet the Lords, and the secondary schools and training of teachers departments, have done their best to keep education in the right paths, in the good old paths, the paths of proper class and hereditary station, the paths of denominational righteousness. The Education Bill has been killed; it has been thrown into the Thames, like a dead dog; it has gone drifting out somewhere near the Isle of Dogs to the sewer outfall at Barking. Education committees have been forbidden to make secondary schools free or even cheap. "Intending teachers" (vulgar phrase!) have been ordered to be unambitious, and leave academical honours to their betters; "elementary" teachers have been kept out of Column B; pupil-teacher centres have been closed, and the grants devoted to impecunious grammar schools of the good old decently-futile sort. In short, the House of Lords, the secondary schools department, and the training of teachers department, have done their best for the good old paths. Heaven bless them! Yet now, after all, the walls they have built are crumbling like Jericho! Parlous times ahead for Whitehall!

GENERAL NOTES.

THE Report of the Board of Education for 1905–6* contains much that is interesting, suggestive, and provocative both of thought and retort. There is something particularly cheering in the sentence, "Each of the five new men inspectors has had, on the average, six years' experience of teaching in secondary schools." We trust that this sensible policy will be extended to the appointment of inspectors in primary schools. In discussing the work of the latter officials under the new conditions, the writer of the report pens the paragraph which we quoted in the last issue of *The Practical Teacher*. (See page 326.) The moving picture of the trembling or pugnacious teacher is distinctly good. The suggestion that the official is never anything but cordial and approachable is better still.

The Latest Report.

THE Board is able to report that the plan "which enabled English teachers of modern languages to be placed in foreign schools, and provided for the appointment of French and German teachers in English schools, for periods of one year," has proved undoubtedly successful. It has been found difficult, however, to arrange for foreign assistants in English day schools. "The English school hours," we read, "are shorter than those abroad, and the time out of school is more fully occupied with games and other things *which do not lend themselves to conversation in foreign languages*." The italics are ours. If the Board of Education is not more careful, it will wake some morning to find itself humorous. But to come back to facts. "During the past year 31 assistants have been placed in France—15 men and 16 women; in Germany 9 men have been appointed; and in this country 19 French assistants—8 men and 11 women—and 2 Germans have been placed in our secondary schools." This is highly interesting, and decidedly on right lines.

A Successful Experiment.

WE are specially interested in the suggestions and plans for the establishment of "higher elementary schools" in large numbers throughout the country, though we have always objected to the title, as not only misleading and meaningless, but also needlessly irritating. The name, we now learn, does not please the Board, which is anxious to secure a better. We still adhere to the opinion expressed in our Notes for October last that the best title is "The Intermediate School." Teachers anxious to prepare themselves for the work of these schools ought to study this report with care. But to avoid disappointment in some quarters, we may perhaps quote a pregnant sentence: "There is good reason for believing that amongst the elementary teachers now entering the profession from the training colleges an increasing number of well-qualified teachers will be found, though it may be desirable to make some special provision in the training college course with the object of securing the supply of teachers required."

The Higher Elementary School.

ON the whole, the Board of Education gives its blessing to the report of the Consultative Committee, to which we gave detailed attention in our October issue. In order to help our readers to form an opinion based upon experience, we are asking two or three well-known Scottish teachers to describe the actual working of the Scottish supplementary courses, which correspond to the "tops" referred to in the Committee's report. Articles on this subject will shortly appear in our columns.

Supplementary Courses.

WHAT is a secondary school? In England it is one which is *not* attended by the children of the working-classes, unless they are scholarship holders. In other words, it is a school for the children of parents who can afford to pay, and who *wish* to pay, in order to secure what they consider to be the proper kind of environment for their offspring. This is plain and blunt, but perfectly true; and we venture to assert that if the position were frankly recognised, much ink and labour would be saved. The so-called educational distinction between the "super-primary" or "sub-secondary" and the true "secondary" of this report is unreal on paper, and does not exist in practice. The distinction is social—snobbish, if you will—and it will last while the British public lasts. It dates from prehistoric times, and will survive the next Teutonic invasion and conquest of these islands.

The Secondary School.

IN the opinion of the Board of Education books of literary extracts are *biblia abiblia*. We agree; but they have, like the "toad, ugly and venomous," a right to their existence. Everything depends upon how the literary extract is used. We have ourselves seen it dealt with in such a manner that it became not only a thing of beauty, but an incentive to further reading. We have asked a well-known educationist to give us his opinion on this matter, and wish to direct the special attention of our readers to his article, which is entitled, "The Use of the Literary Extract." (See page 391.)

Biblia abiblia.

A PARAGRAPH, excellent both in form and substance, has reference to the "organised games" of the new Primary Code: "To the honour of the teachers it should be remembered that these games have often been organised by them already, and their voluntary service has always added greatly to the health and *esprit de corps* of the scholars, but the time devoted to athletics has always necessarily been outside school hours. Many schools in densely-populated neighbourhoods have won great distinction in swimming, a most admirable accomplishment, carrying with it great incidental benefits, but not, when taught in a covered bath, an outdoor exercise. By making the afternoon hours available, a visit to parks and open spaces will be easier; and in the organised games possible there the children ought to win not only something of the physique of boys and girls in our secondary schools, but also the control over their personal desires and impulses which goes far to form character." We agree. If any of our readers has a very black sheep, let him make him captain of the football team. We have tried the plan with excellent results.

"Playing the Game."

A GOOD deal of our space in this number is taken up with reports of several January conferences. These gatherings have been well attended, and the

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papers and discussions have covered wide ground, both professional and educational—too wide, perhaps, for if some great gathering like the North of England Conference would concentrate on a smaller number of subjects, the result would be more tangible. We suggest also to organisers that more speakers from outside the profession should be drawn into the net. For example, in a discussion on the teaching of English literature it would be interesting to hear some prominent man tell, simply and in a straightforward manner, how he obtained his love of reading. If he came to the end of his speech without having had occasion to mention schools or teachers, his audience would at least have gathered some hints on what to avoid. If he numbered the school among the influences hostile to the acquirement of a love of literature, the conference might be still more beneficial. Who will invite the Right Hon. John Burns to an educational conference along with Mr. Chesterton and Mr. Carnegie? Teachers are weary of being talked at by other teachers, however eminent and inspired.

Educational Conferences.

WE have greatly enjoyed reading an article by Professor Findlay which bears the accompanying title, and which has been reprinted from the *Westminster Gazette*. It may be obtained from the National Press Agency, Whitefriars House, London, E.C., for one penny. The paper deals with the religious difficulty from the novel point of view of a lover of children. "For years past," writes the professor, "we teachers have been telling the nation that there is peace *within the school*, that if you leave teachers and children alone the conflict is at an end. Peace and order reign within the school because the teacher, whether or no he imparts religious instruction and conducts religious functions with his scholars, respects the sanctuary of the child's heart and of the child's home; he knows that religious development must bide its time, and come to fruition (helped, of course, by the spiritual ministry of the Church) outside the school walls and within the secret places of the heart."

"Teacher and Priest."

N.U.T. NOTES.

UNFORTUNATELY, I am old enough to recollect the days when evening continuation schools were governed by practically the same regulations as the day schools; and still engraven deeply on the tablets of my memory are certain frenzied attempts to prepare more or less unwilling students (save the mark!) for *individual* examination, by H. M. Inspector, in reading, writing, arithmetic, and drawing, in the requirements of Standards IV. to VI. Unless my memory has temporarily deserted me, it was under Mr. Arthur Acland's historic *régime* that a serious effort was first made to render night schools of real utility to the nation, and he caused to be formulated a series of ordinances, which were issued year after year as the "Evening Schools Code." Then, for a year or two, these schools were governed by the Board of Education's rules for secondary education, which gave way, on the first of August last, to "Regulations for Technical Schools, Schools of Art, and other Schools and Classes (Day and Evening) for Further Education." With the general spirit and intention of these regulations I have no quarrel, yet I do sympathise most sincerely with the evening-school teachers' lament that so much invaluable time is absorbed by absolutely useless and unnecessary labour. This is especially true concerning registration and the compilation of those fatuous returns in which governmental offices seem to delight. When I was the superintendent of a fairly large and successful commercial and technical school, my colleagues, at the end of the session, totalled each pupil's attendances, and gave me the names and grant-earning hours of their various scholars. It was then my bitter lot to arrange in alphabetical order some two or three hundred names, and write out a quasi-brochure, containing the names of the various subjects on the top of columns, and to place in the columns thus provided the hours of the various students in their several subjects. These hours had then to be totalled horizontally and vertically, to check with each other and with the totals of the registers. This irritating task is still exacted to-day, and truly it would be difficult to conceive anything more useless. I have asked myself, in vain, Why is there any necessity for names or for hours of individuals? Surely every reasonable requirement would be fulfilled if the names of the subjects taught were entered on a sheet of paper, foolscap size, and the total hours made by grant-earning students entered by the side! The certificate of the superintendent and the Local Authority should be accepted as a guarantee of the accuracy of the returns, although the Board of Education could at any time demand the actual registers and do some checking of their own.

Concerning Evening Schools.

LESS than a month ago it was my privilege to preside over the deliberations of a sub-committee convened to consider the whole question, and I had the good fortune to be assisted by the President and Vice-President of the Union; Mr. Hole, Vice-Chairman of the Education Committee; Messrs. Sharples, Mawbey, and Nicholls; and Mr. Ernest Gray, M.A., Secretary to the Committee. First the Education Committee, and next the Executive, adopted the sub-committee's views, and the following recommendations will be made forthwith to the Board of Education:—

The Executive's Recommendations.

"1. That, for the purposes of grant payment, the fourteen hours' limit described in Section 29 of the Regulations for Further Education be abolished.

"2. That the total number of hours made by all students be the basis of calculation.

"3. That Form 803 be abolished.

"4. That an alphabetical list of students is unnecessary, and should not be required.

"5. That the attention of the Board be drawn to local regulations respecting the payment of teachers where the number of students falls below a fixed minimum, and that the Board should be asked to frame such regulation as would require the Local Authority to pay for lessons actually given.

"6. That the principle contained in Section 34, whereby a block grant is payable by the Central Exchequer to the Local Authority, in respect of an organised scheme of instruction framed by the Local Authority and approved

by the Board, be extended to county boroughs and to the county of London.

"7. That inasmuch as the method of assessment of grant under Section 34 is too complicated, and leaves so much uncertainty as to the amount likely to be received by a Local Authority, this method of assessment should be abandoned, and in lieu thereof the Board should establish a scheme under which the payment from the Central Exchequer should bear a definite relation to local expenditure, in respect of evening schools."

A deputation, consisting of the gentlemen named at the head of the paragraph, and Messrs. Busby and Wretts-Smith, will attend personally at Whitehall to urge the acceptance of the Executive's suggestions. A. C.

NOTES FROM THE NORTH.

THE thirty-third annual Congress of the Educational Institute of Scotland was, after a lapse of only six years, once again held in Dundee. This was in large measure due to the fact that the president for this year hails from the "Jute" city. The weather was, on the whole, most favourable, with the result that there was a very good gathering of delegates from various parts of Scotland. The recent blizzard, with its most disastrous railway accident a few miles to the north of Dundee, had little, if any, appreciable effect on the attendance. The Congress papers were of a high order, and the presence of the Secretary for Scotland was an attraction to many. It cannot, however, be said that his address drew the veil from the future, so far as educational legislation is concerned, and many must have felt that he very carefully concealed the Government's intentions with regard to Scottish education. His remarks, however, were most sympathetic; and if they were not merely platform utterances, there is every hope to believe that the teachers of Scotland will find in Captain Sinclair a true friend and a thoroughly sympathetic adviser. We in Scotland trust that the year 1907 will be fraught with far-reaching consequences with regard to elementary, secondary, and university education. The teacher's position will, we feel convinced, become one of greater importance, and the need for university reform is now a pressing question of public interest. There were, this year, fewer resolutions on the Congress programme, but those that found a place were of the greatest moment—superannuation and university reform. These two problems are likely to be settled in the present year, and the teachers of Scotland are anxiously awaiting their solution.

The E.I.S. Congress.

THE president, Mr. John Mudie, F.E.I.S., Glebelands School, Dundee, took as the subject of his address, "Moral Purpose in Education." At the outset he asked, Were the schools of to-day meeting the demands of the nation for an educated people, capable of holding their own in the struggle for existence? If the teachers could answer that question in the affirmative, then the common schools of the country might be said to be fulfilling their destiny. But what did they see in many large cities? Hooliganism rampant, loafers at street corners, crime and drunkenness ever with them. Was it possible for education to lessen perceptibly these long-standing evils? He thought that if the purpose of public school education was more directed to the development of moral character and the formation of right habits of conduct in the pupils, they might at least hope to lessen these evils and prevent this waste of moral and physical energy which was such a great loss and expense to the nation. Their efforts in the past had been mainly directed to the development of the intellect and the acquisition of knowledge by the pupil, the moral and emotional side of his nature being fed by the crumbs that fell from the wealth of the other subjects taught. With the abolition of the individual examination the time and opportunity had come, or were coming, when the teacher would appeal to those invisible forces that were the outcome of personality in the pupil, when tendency and disposition in the pupil would not only be studied by the teacher, but would be looked for, so that the pupil might be directed along those paths best adapted for the development of his moral and intellectual nature. The pupil must be studied and understood as much as the subjects of instruction. Those peculiarities of temperament, which were so often difficult to deal with, must receive careful attention, and become, in the hands of the teacher, the means of reaching the pupil's moral nature, of stimulating his mind to an active interest in the work of the teacher, which would gradually bring the pupil to realise that the teacher was his friend, one deeply interested in his welfare. The teacher having gained the confidence of the pupil, that bond of union would facilitate the work of the teacher and maintain the interest of the pupil in all the various subjects of school instruction.

The President's Address.

AFTER dealing at some length with the processes by which habits were formed, and the necessity for knowing how to take advantage of these processes, Mr. Mudie asked what else the school was to do for the pupil. The acquisition of knowledge and the sharpening of the intellect were certainly desirable, but the acquirement of knowledge must only be the means of developing character. It was men and women that were in formation during school life, and the building up of manhood and womanhood should ever be the conscious purpose of the teacher. This kind of work did not lend itself to measurement; hence the fear that, in these days, the moral nature of the child had not received its full share of the time and attention of the teacher. Teaching morals required time and labour, and with an overburdened curriculum the things that were invisible had given way to the things visible. In our schools to-day we needed more of the literature of the Bible—a literature that breathed the moral spirit, and always placed the moral issues in the very foreground. He deprecated the examination of pupils in Biblical knowledge as detrimental to the best interests of the pupil, for the teachers' efforts then were directed to the acquisition of Biblical knowledge by the pupil—a process that often led to the most essential part of the Bible lesson being omitted, the beauty of the moral being sacrificed, that the pupil might have a full literary knowledge of the lesson studied. To-day, in conclusion, he said, there was, without doubt, much moral instruction given in our day schools, but it seemed to him more incidental than consciously purposed. It was the conscious purpose that brought the harvest. It was the duty of the educational authorities and the privilege

The Development of Character.

of the teacher to see that the children committed to their charge leave school with such a moral and mental equipment as would enable them to enter on the struggle of life with every hope of success.

DR. DICKIE, secretary to the Board of Examiners, on introducing Principal Donaldson, Vice-Chancellor of St. Andrews University, as a recipient of the honorary fellowship of the Institute, referred to the fact that in 1854 the Institute had elected him to the fellowship, and that, on his translation to the rectorship of the Royal High School, Edinburgh, he had been chosen president of the Institute. The president, in presenting the diploma, explained that it was conferred on Principal Donaldson in recognition of the special services he had rendered to the cause of education, first as rector of the Edinburgh High School, second as professor of Humanity in Aberdeen University, and third as principal of St. Andrews University, and as an eminent educationist and president of the Educational Institute of Scotland. Principal Donaldson returned thanks in a speech brimful of pawky humour and interesting reminiscent detail. He had been fighting, he said, from 1856 to the present day. In that fight they had had various issues. He then referred to the original objects of the Institute, and remarked that one which had not been very successfully carried out was that higher class masters and the ordinary public school teachers should meet on terms of equality and discuss educational matters together; but, owing to circumstances, a gap had been created between the university and the secondary school, and another gap between the secondary schools and the primary schools. Something must be done to cure that state of matters. Patriarch as he was, and hard fighter as he had been, in matters of education he was still full of hope for the future. Regarding the position of teachers, he believed the time would come when their pensions would be like the pensions of other civil servants—namely, two-thirds. When they got fixity of tenure and pensions as part of the educational machinery of Scotland or anywhere else, there would be no lack of teachers. The lack of teachers was to be cured by making teachership attractive. Principal Donaldson received quite an ovation.

Honorary Degree for Principal Donaldson.

CAPTAIN SINCLAIR, the Secretary for Scotland, who was accorded a hearty reception, said it was rather as a local member that he was there, not only to testify to his own warm interest in the subject of the teacher's work, but also as one of the band of Scottish members in the new and eager House of Commons to testify to the deep and earnest desire there was among these men to do something in their time for the interests of education. There were one or two points in regard to Scottish education—pressing points which might demand, and which might, he hoped, receive consideration, if not in the immediate, at any rate in the near, future—which he would mention on this occasion. The president, in his address, stated that in the past the education given in our schools was perhaps too strictly a mental education, and there had been considerable expression of opinion that further powers were even now required by school authorities to enable them to realise the wider conceptions of a school and of its duties towards the child. It was true that the school could never take the place of the home, but there was room for a wider conception of the part which the school could play in co-operation with the parents in bringing up and training a generation which would be soundly developed all round. They wanted healthy schools. They wanted physical exercises which would be directed to repair the defects of particular constitutions. There was room for the medical inspector in the school; and there was room—in rural districts, at any rate—for the development of school gardens and the like, which should be directed to broadening the intellectual life of the child. That raised the question as to whether or not they would have to bring home to parents more closely than hitherto their indefeasible and inalienable responsibility for the proper feeding and care of their children, and even provide, when it was clearly proved that parents had done all that they could, and that all was yet insufficient, that their efforts should be seconded by some form of social effort.

The School and the Home.

CAPTAIN SINCLAIR thought that all this reacted upon the conception of the teacher and his work. The whole foundation and position of the teacher and his or her responsibilities were widened. He hoped that the new system for the training of teachers, the foundation of which had recently been laid by administrative effort, met with general approval. But it was not enough to lay the foundation. The career of the teacher and the training of the teacher for that career became each year more elaborate and more costly, both as regards time and effort. If they were to attract to this noble profession men and women of the highest ability and capacity, they must look beyond the official training, and look to the ultimate conditions of service. To maintain the high standard which at present existed, to develop it, and to improve it, they must ask themselves whether the ultimate conditions of service, both as regards tenure and provision for old age, did not admit of improvement. Legislation could do a little, administration could do a great deal, if there was that give-and-take, that understanding and sympathy between the Department and the School Boards and the teaching profession, and most important of all, the interest of the whole people at large in education. They could never realise their ideals in education in this country unless they could conform to the conditions of progress, and they would never realise their ideals unless they carried with them, at every stage, the intelligent sympathy of the parents and of the people at large.

The Teacher and his Work.

THE president, in introducing the representatives of England and Ireland, referred to the pleasant relations that had always existed among the teachers' organisations. Mr. T. B. Ellery, F.R.G.S., Luton, on behalf of the National Union of Teachers, expressed the friendly sentiments of his constituents towards their colleagues in Scotland. In referring to the Education Bill, he said he belonged to a body which was practically unanimous in favour of the passing of the Bill. He could not say that they all agreed with every line of it, but they deeply deplored the fact that it was lost. With regard to superannuation, he assured Congress that whatever steps were taken by the Scottish teachers to improve

Foreign Delegates.

the miserable allowance to teachers would have the hearty support of the teachers in England. In the discussion on superannuation Mr. Ellery also took part, and made reference to the estimated cost of the scheme, and compared it with its actual cost. The other delegate from the N.U.T. was Mr. Hamilton, treasurer. He had an opportunity of voicing the sentiments of his colleagues at the dinner on the Friday. The I.N.T.O. was represented by Mr. Maher, B.A., Tipperary, who began by quoting Burns, and embraced the opportunity of saying, in the presence of the Secretary for Scotland, that the Imperial Parliament had not treated the teachers of Ireland justly. He also took occasion to point out that Ireland, which had very nearly the same number of children attending the primary schools as Scotland, received half a million of money less in grant than Scotland for the present year. Mr. D. Elliot, B.A., Belfast, was the other representative.

TO Mr. D. M. Cowan, M.A., Glasgow, convener of the Superannuation Committee, was entrusted the only resolution of the first day's proceedings. It was as follows: "That the Educational Institute of Scotland respectfully urges upon the Government the necessity of improving the scheme of superannuation for Scottish teachers." In submitting the motion, he said the teachers had the great body of opinion in the country on their side, and had a requisition signed by between fifty and sixty of the Scottish members of Parliament, irrespective of party, calling upon the Government to do something immediately in the matter. It would seem as if the battle were won, but the question was how to put these fair words into some concrete form. It had been from the beginning the policy of the Institute to bring in the three bodies most keenly interested in the question. The teachers themselves could scarcely expect to have a proper superannuation scheme unless they were prepared to make personal contribution. They considered that the School Boards ought to make a contribution to the fund, and that the Education Department should also give considerable assistance. It might be said that the Treasury would not give to the Scottish teacher more than it gave to the English teacher; but Scotland had its own traditions with regard to education, and with regard to its treatment of teachers, and they wished Scotland to build a future on its past. It may be pointed out in this connection that the Institute has recently adopted a new scheme for superannuation, and for the sake of English teachers I give it here in full:—

Superannuation.

"1. That School Boards be empowered to grant pensions or retiring allowances to all teachers in their service, irrespective of whether such teachers have accepted the Elementary School Teachers' Superannuation Act of 1898 or not, and anything in the said Act to the contrary notwithstanding.

"2. That, for the purpose of this Act, the Scotch Education Department shall contribute from moneys accruing to Scotland sums equal to those granted by the School Board or other recognised educational authority, provided always that the total pension or retiring allowance from all sources shall not in any case exceed two-thirds of the teacher's salary at the time of retiral.

"3. That the provisions of this Act with regard to pensions or retiring allowances shall be retrospective in the case of teachers who have retired since April 1, 1899.

"4. That School Boards, and also the Scotch Education Department, shall be empowered to make grants of money to the dependants of teachers who die in service."

MR. HUGH M'CALLUM, Glasgow, convener of the Institute Committee on Higher Education, submitted the second resolution of Congress as follows: "That this Congress is of the opinion (*a*) that, in the interests of higher education, the requirements of the preliminary examination and the regulations regarding graduation in the Scottish universities should be revised; and (*b*) that meanwhile the course of training for teachers should provide opportunities for (1) preparation for the university preliminary examination and (2) for graduation in Arts and in Science." Speaking to the motion, Mr. M'Callum urged that the preliminary examination should be merely a test of the general education of the student, showing that he was in a condition to profit, more or less, by entering upon a degree course at the university. Three subjects were compulsory—namely, English (in which he entirely agreed), Latin or Greek, and Mathematics. In regard to Latin or Greek, there was no use blinking the fact that the privileged position occupied by Latin had been, was being, and would continue to be, challenged by other subjects which people considered had an equal claim upon the students. If Latin were to be retained as a compulsory subject, it was only on the assumption that it was necessary for the study of other languages, or perhaps for study in general; but let the preliminary examination be on such a basis and standard as would satisfy the examiner that the student had in Latin an efficient instrument for the prosecution of the studies which he might select afterwards in his degree course. As to graduation in Arts and Science, nobody was satisfied with the conditions of the Scottish degree. Unless the ordinances of the universities were revised, and the course of studies adjusted in some way, teachers were to be excluded in very large numbers from entering universities, and that would be a calamity.

University Reform.

OTHER addresses of a very interesting character were given by Professor Edgar, St. Andrews University, on "School and Health, with special reference to the approaching International Congress of School Hygiene;" by Mr. Alexander Mackay, B.A., Leith, on "The Class Teacher;" by Mr. J. MacPherson Wattie, H.M.I.S., on "Some Present Tendencies in Education;" by Principal Mackay, University College, Dundee, on "The Importance of the Universities to the larger Industrial Centres." The afternoon of the second day, as usual, was specially given over to papers by lady educationists. Mrs. Gordon, D.Sc., Ph.D., Aberdeen, discussed "How to guide Boys and Girls to Suitable Occupations." As the result of her work in Aberdeen for the last three years, she hoped in time to see a bureau established in each industrial centre, which would be recognised as a public office in connection with their educational authorities, and would bring the employers of the district more into touch with the efforts that were being made in the

Other Addresses.

schools towards helping boys and girls to be good citizens and intelligent workers. Mrs. Hannay, St. Andrews, gave a most interesting address on "Vacation Schools and Guilds of Play." She described the school started in 1902 in London. The object of the school, she pointed out, was to give each boy and girl as good a time as possible, as well as to find out their tastes, and the cost of this had worked out, in 1905, at eightpence per child per month.

* * *

Adjuncts of Congress.

AS is customary, there was a great round of social functions. The chairman of the Dundee School Board gave a breakfast to the members of the General Committee of the Institute. The class teachers held a smoker and a breakfast. The dinner was a decided success, and the toast list, though somewhat long, provided not a few with the opportunity of airing their opinions on various subjects. The ladies' "At Home," the reception, and assembly passed off with great *éclat*. Mention should be made of the tastefully got up Guide of the Congress, generously given by Messrs. W. and R. Chambers, Ltd. It is full of very valuable information with regard to the educational activities of Dundee, and will be much appreciated by all who visited Congress. The Dundee branch worked like Trojans to make the Congress successful, and their efforts were generously acknowledged on the closing day. To Mr. Robert Loggie, Congress secretary, and Mr. Anderson, convener of the Papers Committee, the best thanks of those who attended Congress are specially due. Perhaps to no Congress in the history of the Institute has the press of Scotland given such a great amount of space, and certainly to none have such laudatory leading articles been contributed. Whether this is an evidence of the high character of the papers read, or of the increasing power of the Institute, I would not like to say. But this much I do say, that at no previous Congress was the child put so much in the foreground and the teacher and his grievances kept so much in the background. To this fact more than to any other do I attribute the public interest in the Congress of 1907. R. D.

THE TEACHER'S USE OF THE LITERARY EXTRACT.

[The following paper deals with a question which is at present agitating the minds of many teachers, education authorities, and inspectors. It is from the pen of a well-known educationist, who prefers to remain anonymous. The editor would be glad to place the columns of *The Practical Teacher* at the service of any educationists who are interested in the matter and wish to state their views.]

THE advisability of using a book of literary extracts as a school Reader at all is not the question to be treated here. The comparative merits of the Continuous Reader, and what it is becoming a little fashionable to call "a Book of Snippets," would form a very interesting subject of debate, and one that deserves treatment for the sake of school authorities, who are more and more inclined to take the choice of books out of the hands of teachers. But our present purpose is rather to take the book of literary extracts as granted, and to consider the best way to use it.

It may be fairly assumed that the Reader selected has been compiled with sufficient skill to make it suitable for the work of school. The Temple Readers, Blackwood's Literature Readers, and Nelson's Literature Readers may be taken as samples of what may be regarded as satisfactory working books for school purposes. If the contents of such books are analysed, they will be found to consist of three kinds of extracts.

There is first the extract that is so independent that it is hardly right to call it an extract at all. Sometimes, indeed, it is not an extract, but the whole literary unit. This is the case with many of the poems included in such Readers, but it is also true with regard to such prose passages as a letter from Cowper or an essay from Addison. But to this class also belong passages that are really extracts, and yet from their very nature are so independent of their larger context that they stand quite well alone. Thus in Book II. of Nelson's Literature Readers we have, under the title of "The Young Geologist," an eight and a half page extract from *The Old Red Sandstone* that is quite independent of what precedes and what follows.

The second class of extracts may be as independent of their original context as the first class, but from their relation to the rest of the extracts they acquire a secondary dependence on each other for the purposes of the Reader. Thus in the Reader just quoted there are three lessons brought into direct relation to each other by the nature of their subject-matter and by their juxtaposition. These are "Work" from Carlyle, "The Dignity of Labour" from Newman Hall, and "Labour in Utopia" from Sir Thomas More. This collocation of cognate subjects that illustrate each other is still more marked in Books III. and IV. of Blackwood's Literature Readers. But the careful teacher will not be content to limit himself to such obvious collocations. Wherever possible he will find a point of contact between lessons that do not bear a surface resemblance to each other. Thus the trilogy on labour may be well illustrated in Nelson's Reader by a reference to "The Young Geologist," which deals with the same subject from a somewhat different point of view.

The third class of extracts are really obviously extracts. They imply that something has gone before, and they suggest something that must come after. They have a certain completeness in themselves if the Reader in which they are found is well made, but they are undisguisedly incomplete. A scene from *The School for Scandal* (Blackwood's IV.) is an extract open, unashamed. De Latude's *Escape from the Bastille* (Nelson's II.), though complete in itself, clearly suggests that there is more to follow. The unsettling force of this class of extracts, so far from being a disadvantage, is a positive benefit, since it does not allow "to fust in us unused" that godlike power of "looking before and after."

But however carefully the selections have been made, however well rounded off each may be in itself, the teacher has the paralysing feeling that each in turn looms out of the black unknown into the murky light of the present knowledge of his pupil. As is said of Maggie Tulliver: "These mysterious sentences, snatched from an unknown context—like strange horns of beasts, and leaves of unknown plants, brought from some far-off region—gave boundless scope to her imagination." The first thing the teacher has to realise is that he must not interfere with this scope. Too frequently he is wedded to the belief that nothing of itself will come, so he must still be seeking ways of explaining what requires no explanation. Listen to Ruskin in his *Modern*

Painters: "Explanations are wasted time. A man who can see, understands a touch; a man who cannot, misunderstands an oration." Like most of Ruskin's sweeping statements, this has to be understood in the light of common sense. The lesson for the teacher is to economise his explanations. The man who can see may understand a touch, but still that touch has to be given; it is the irreducible surd of explanation. The teacher must discover the touch necessary in each case. A touch may be administered by a feather or by a club.

An excellent beginning to the study of explanations would be for the teacher to nail up behind his door a copy of one of the old-fashioned editions of one of the plays of Shakespeare, with its three words of notes to every word of text, as an awful example of the sort of thing to avoid. The important thing about the extract is the extract itself, the living extract; not its dead elements.

The "Preparation Step" of the Herbartians is an excellent thing in itself. It must not be allowed to damage the whole value of the reading of literature. Too often there is so much preparation for the reading of an extract that, by the time the pupils get at the extract itself, they are bored by the whole subject; and in any case they know that the bell is about to ring. There is here no attack on the "Preparation Step" as such. All that is claimed is that the person who made the selection has done some at least of the work of that step. Take up any of the three series of Literature Readers referred to above, read the first paragraph of each extract, and you will be astonished how many of them make a complete beginning, so far as a beginning is necessary in literature. It has to be remembered that in artistic narrative it is rather the exception than the rule to begin at the beginning. The author frequently desires to thrust his reader at once *in medias res*, and a good deal of the charm of the reading is the finding one's footing in the strange land into which one is introduced. No doubt, particularly in the case of the third class of extracts, it is sometimes absolutely necessary to give a brief introduction to prevent unnecessary floundering. Thus the extract, "Charles Surface sells his Ancestors," necessarily implies a brief introduction. On the other hand, the first sentence in Nelson's Book II., "Silas Marner's determination to keep the 'tramp's child' was matter of hardly less surprise and interested talk in the village than the robbery of his money," may be quite well used as the ordinary commencement of a tale. Some of our best modern writers deliberately begin their narratives in this way.

If it is undesirable to give a lengthy introduction regarding the subject-matter of the extract, it is surely much less desirable to begin with some account of the author. The unjustifiable prominence formerly given to authors in books of extracts was the result of a pernicious confusion between two things that must be kept apart. English literature has too long been confounded with the history of English literature. It cannot be denied that the two are connected, but one is of infinitely greater importance than the other; and it has not, in time past, been the important one that has had its horn exalted. Of late we have come to realise that an author owes his importance to what he has written, not to the year when or the village where he was born. In times past each extract was preceded by a long statement in distressingly small type, giving a sort of "Who's Who" account of what the editor thought it worth while the reader should know. This had to be mastered before the lesson began, and had to be remembered long after the lesson was completely forgotten. An examiner for an important university the other day held up a book of literary extracts, and asked how he could be expected to examine on it. It was a big book; but as it had neither notes on the text nor lives of the authors, this examiner did not know what to do with it. For him it was empty. It contained nothing but masterpieces of English.

It is significant that the lives of the authors now take a humble place in the part reserved for them at the end of the book. These notices are useful, and ought not to be neglected. But the text must first be mastered. Unless the pupil be interested in what a man has written, why should he be bored with the man himself? Dull as a literary man's writings may be, his life is almost invariably duller.

To compensate the author for thus keeping him in his own place, the teacher ought to see to it that the author has a chance in the classroom. After the irreducible minimum of introductory explanation has been given—and we have seen that in some cases this may be represented by zero—let the pupils read the extract right through, thus allowing each part of the extract to support the rest. What is obscure in the first paragraph frequently becomes clear as the lesson proceeds. Even when a certain amount of positive explanation is necessary to the full understanding of a passage, it will be found on many occasions that this explanation is gratefully received after interest has been aroused by reading the whole passage; while it would have been at best only patiently endured before the reading. In the extract "The Combat," from *Amadis of Gaul*, in Nelson's Book II., there is clearly need for some indication of the context; but the introduction of this context will be made much more satisfactorily after the first reading. The distinction between an extract and a snippet is that the extract has a certain body of its own, having the Aristotelian beginning, middle, and end, and therefore has a relative independence that gives a meaning, though not, of course, the full meaning, to all the elements.

When the author has had his chance by being allowed to say his say directly to the pupils, the time comes for the teacher's contribution. This is of two main kinds—that dealing with form, and that with matter. Naturally, the two must not be kept rigidly apart; neither is of value apart from the other. Each can be understood only by reference to the other.

In a suitable Reader the extracts are just a little more difficult than the pupils can read without any help. This implies that the great mass of the words and phrases are quite familiar to the class, but that in each extract there are a few new expressions. Some of these explain themselves by their context. The teacher has only to examine his own experience to find that many of the most important words in his everyday vocabulary were never explained to him at all, but gradually wormed their way into his vocabulary by context penetration. Explanation of individual words and phrases is best done by means of off-hand paraphrase. The pupil should be invited to express the meaning of the passage in which the new combination occurs. The teacher will very seldom be driven to supply a version of his own. Almost invariably some of the cleverer pupils will be able to furnish a sufficiently accurate equivalent. When a satisfactory rendering has been found, there will be no need to invite the attention of the class to the superiority of the original. One of the worst kinds of note

to a text is that which consists in some such remark as, "Note the beauty of this passage." The reading of the passage, with the attempt to make clear its content to a listener, is the only way to enable the pupil to note the beauty. The noting must be the work of the pupil, and he cannot note to order. Remember what Jacotot used to say about teachers: "They are people who go about the world wringing their hands and asking, 'Don't you see? Don't you see?'"

It is with regard to the subject-matter that teachers are apt to go wrong. There is so much to be known about everything, and their pupils know so little. The complete rounded whole is a constant snare to the teacher. *Teres atque rotundus* is an excellent text for a sermon of warning to the expository teacher. The teacher cannot know too much about the extract he is dealing with, but he may well tell too much about it. A class has a saturation point as clearly marked as, though infinitely more difficult to determine than, the saturation point of an ordinary solution. There is nothing that more clearly marks the fine teacher than his knowledge of when his class has had enough of new matter in a given lesson.

For it has to be noted that in dealing with the subject-matter of an extract the teacher has to discriminate between the introduction of new matter and the manipulation of old. Every extract read by a class is projected against the background at that moment available for that class. Each pupil interprets what is presented in terms of what has been previously presented. To make a pupil understand a new passage, it is too often assumed that he must be told a great number of new things. In point of fact, it is seldom necessary to give much that is new, though it is often essential that the present content of the pupils' minds should be rearranged to suit the new matter brought forward in the extract. Our minds are at all times full of potential knowledge that has never been brought to fruition. The plumber maintains that a particular change in your water system cannot be accomplished. You point out to him this fact and the other, both of which he knew as well as you, but which he had not before brought into relation with one another. He sees the point, and with the remark, "Oh, if you put it that way," sets to work. It is not that you have imparted any new knowledge, but that you have rearranged knowledge that he has already, in such a way that it becomes dynamic. The passage from the static to the dynamic is the work of the pupil, but it may be greatly assisted by the way in which the teacher manipulates the present content of the pupil's mind. Instead of hunting all over the field for new matter to illustrate the extract, the teacher should spend most of his time in rummaging among the material that he knows to be already within the pupil's knowledge. The clever teacher, in particular, is in constant danger of going wrong in the proportions that should subsist between the old and the new in a given lesson. Pupils are not nearly so easily bored with old matter as the clever teacher imagines.

With a respectful treatment of the extract as a thing intelligible in itself and not a mere adjunct to a mammoth explanation, a dialectic treatment of the forms of expression, and a reconstruction of the necessary background, the teacher has done his work in respect of the extracts of the first and second class. The third class involves a new application of the passage from the static to the dynamic. The great value of this class of extract, as compared with the other two, is its power to arouse the interest of the pupils, and make them anxious to read more of the work from which the extract is made. It is therefore the business of the teacher to make himself acquainted with the possibilities of the pupils reading certain of the originals in a more or less complete form. He must here be warned against expecting too much. There is only a limited amount of such reading possible to young pupils. The nature of this reading is determined by two conditions in particular—first, the nature of the books; secondly, their accessibility. Since this class of reading is to be purely voluntary, it must commend itself to the pupils by its inherent attractiveness, and will therefore differ with each pupil. But, generally speaking, it cannot be expected that pupils will take up heavy works, even though there may be interesting extracts made from such works. For example, "The World at Auction," in Nelson's Book II., is an admirable extract and full of interest; but the teacher will find, on reference to the original passage (*Decline and Fall*, chap. v.), that the context is not at all suitable for the further reading of pupils at this stage. On the other hand, a selection from *Ivanhoe* or from *Pickwick* should lead to further investigations by the youngsters. It must not be supposed that fiction alone can attract to wider reading. History, natural history, science treated as literature, poetry of an objective kind, all claim their enthusiasts among the pupils brought up on extracts. The teacher should regard the number of pupils whom he sets to reading the originals as the test of the success of his teaching.

The teacher should make it a matter of conscience to be able to say of every extract that he teaches, that he has himself seen that extract in its original setting. The value of this apparently simple proceeding is infinitely above what one would expect who has not applied it in actual teaching. A further application is not so troublesome as it looks, and will very greatly enhance the value of the work in school. This consists in bringing to the class in every case a copy of the actual book from which the extract for the day has been taken. Running down the list of books from which Dr. Richard Garnett has made his selections for Nelson's Literature Readers, one finds that there are extremely few that cannot be readily procured. Many of them are to be had in those cheap reprints that are such a feature of the present day, a form specially suitable for the teacher's purpose, inasmuch as they are so readily obtained by the pupils themselves. In one edition or another the actual book should be present at every lesson, for no one who has not tried it can estimate the dynamic power of the actual presence of the book itself.

CHAMBERS'S CONCISE GAZETTEER.—In our review of this useful handbook in last month's issue we stated that no mention was to be found of the Gulf Stream. We sincerely regret our omission, as we find, upon a more careful reference, that the friend of our early youth still retains its former distinguished position as the patron of "the climate of Western Europe."

Teachers interested in the

NEWER METHODS OF TEACHING ENGLISH LITERATURE

are asked to consult the Advertisement on page 4 of the Cover of this issue.

THE JANUARY CONFERENCES.

BY OUR SPECIAL CORRESPONDENTS.

I.—The London Meeting.

ONE mind sharpens another, even "as iron sharpeneth iron," said Solomon, who must have been familiar with conferences; and from the clashing of wits and experiences with which 1907 has been ushered in, much good ought to accrue. Time was when Easter week was the Conference week *par excellence*, but now no season is without some meeting of greater or less interest. It is a good omen, for it betokens a preoccupation with the topics that are of the first importance to us, the teachers; for which let us be devoutly thankful.

The London Conference was of a general nature, organised by the London County Council, and opened on Thursday, January 3, with a discussion on the teaching of modern languages. The chairman of the session, Mr. Shepheard, led off with a *résumé* of educational work in London, which was full of hope for the future, "provided the public purse did not give out." Mr. Von Glehn then introduced the topic of the morning, and urged, as the only correct method, what is known as the "new" or the "reformed" or "oral" method. The older methods sacrificed everything to grammar and translation; the modern makes grammar an episode, and aims at knowledge of a language as a living thing. But this way has two requirements of first-class importance—a teacher who is saturated with the language he is teaching, and one who will work, for on him everything depends. A M. Latour, in the course of the discussion, described the English as a "silent race," and ascribed to that quality our lack of enterprise and attainment in modern languages; and yet another speaker, a lady, said we are lazy. Both of these seem to us to be hasty generalisations, for the Britisher can be *loquax* if he is interested, and laziness is hardly our besetting sin.

The afternoon discussion was equally interesting—"Shakespeare in the Schools," introduced by Professor Gollancz. The old system of hunting for Shakespeare's bad grammar, and wading through page after page of notes, met with short shrift. The main thing is to keep attention fixed on the dramatic form; and he even went so far as to advocate a school Shakespeare festival yearly, when plays should be acted in a simple way by the scholars. The idea is fine, though we see many difficulties in the way of carrying it into effect. But of the value of the dramatically presented scene or play we have had personal proof. We have made experiments in this direction, and we can vouch for the wonderfully quickening effect of the attempt to render in action even short scenes of some of Shakespeare's plays. It must be remembered, as the chairman, the Hon. W. N. Bruce insisted, that this question of Shakespeare in the schools is only a part of the larger question of the study of English. We reiterate the point, because it must not be thought that the end of such study is to secure even a tolerable dramatic exhibition by school children, but rather to use their dramatic instincts to quicken and vivify an interest in their mother tongue generally. Skilfully used, the play does this. We commend to all our readers the first-day's discussions; they teem with suggestions

After the mind, the body. Friday brought forward "Organised Games for Girls," with a capital introduction by Mrs. Humphry Ward. Her description of the raptures of "tig," and of the boredom of the "crocodile walk," as the only games or exercises permissible in the last generation of girls' schools, was highly effective. One really wonders, in this year of grace, how such things were possible. The writer has in mind a large and well-known establishment, in which his own female relatives were educated, where to romp or jump was "unladylike," and promptly punished if detected; where the "backboard" was the only gymnastic apparatus; and where the weekly lesson in "deportment"—that is, making mock afternoon calls on the head of the school—was the only game, if game it could be called.

Miss Lawrence, the head of that superb school for girls at Roedean, near Brighton, struck the right note. She insisted on the moral value of games for girls, their usefulness in inculcating self-reliance, fortitude, and initiative. Men have long known and valued this among boys: why should not the same effects follow in the case of girls?

What *would* the Miss Pinkertons of the last generation have said to Sir Lauder Brunton? Imagination boggles at the thought. For he compressed the physical importance into a nutshell, and damned the "ladylike" deportment of the past in one sentence. "Joy has the most powerful effect on the circulation, and increases bodily and mental vigour"—a sentence we should all learn by heart and write on our classroom walls.

This jewel of great price occurred in the afternoon discussion, which was devoted to the same subject in connection with boys. There was much propriety in keeping the two discussions separate. In our anxiety to make up for past deficiencies we are apt to rush into extremes, and to think that exactly what is good for the gander is good for the goose. It is a mistake. Girls are girls, and cannot do just as boys can. It was this warning which Dr. May Thorne and Dr. Forman impressed on the Conference. There must be selection in games for girls—all are not equally good or advisable; and though we need not go to the extent to which folk go in the United States, where games and athletics are performed under the advice and supervision of a medical man, there must be moderation.

But Friday, if it produced nothing else—and it produced much—has given to the world of teachers that one reminder which is worth untold gold. "I thank thee, sir, for teaching me that word"—joy. For it follows that not only the joy which is produced in free, exhilarating play is beneficial, but that joy is a stimulus in every department of school work. When we think of the "dominie" of our youth, and the ferule which was his sceptre, and the stern discipline under which our first young years were passed, our gratitude to Sir Lauder Brunton knows no bounds.

The last day's discussions dealt with "The Artistic Training of the Craftsman" and "Educational Experiments." The first topic circled round bookbinding, silversmiths' work, and printing, each treated by an expert. The real value of this discussion lies, of course, in the help it can give towards solving the difficulty which arises from the dying out of the apprenticeship system. While confessing our incompetence as an expert in craftsmanship, we venture to make a suggestion,

based on a little personal experience. At Furtwangen, a tiny village in the Black Forest above Triberg, there is a manufactory of clocks and of all sorts of articles in which clockwork machinery is employed. There is also an art school, in which the village workers are trained, first in general art work, secondly in the application of artistic ideas to the material of the trade of the place. Any one who strolls into the little museum in the village —the *Gewerbe Halle*—will be struck by the result. And Furtwangen seems to us to supply just the hint for use in connection with "the artistic training of the craftsman." You can't train a craftsman *in vacuo*. You must, after developing his artistic capacities generally, train him in the application of his ideas to the materials of his craft, just as those materials are understood and employed in his particular craft at the particular time. That is what the "trade guilds" did, among other things.

With regard to experiments in schools, we hope the publicity given to experiments such as those detailed by Mr. Jackman, and by that most admirable of infants' teachers, Mrs. Shaw, will stimulate others to experiment in their turn. It has always been a sort of reproach to England that experiments in education have been looked upon rather as "flying in the face of Providence," as dangerous practices to be discountenanced rather than fostered. But Saturday's discussion, from its very tone, gives the deathblow to that reproach, and arouses the hope that experiments will be welcomed.

In sum, the Conference has been a profitable one, for it has allowed a good many ideas to be ventilated, and may provoke action. The first two days were specially stimulating; and as it is the practice of the London County Council to publish, *in extenso*, the papers and discussions at these conferences, we hope that all teachers in London who have their profession seriously at heart will take the opportunity of reading and sifting the reports themselves. A Conference which results merely in the letting off of what the Americans call "hot air" will have failed in its intention.

II.—At Leamington.

While teachers and friends were conferring in London, the head teachers were in Conference at Leamington, under the presidency of Mr. Stacey of Salford. The proceedings were interesting, and we abstract from the doings of the Conference some of the most notable points. The president took the right line in inveighing against the large size of classes in elementary schools. An educational waste, he called it, and rightly. For us, we have never been able to fathom the wisdom or equity or logic of an arrangement that can allow a maximum of thirty-five per class in a secondary school at the same time as the monstrous classes which have been the rule, and even yet are to be found, in the schools of a lower grade. One can only justify it on the supposition that children's brains vary as the income of their parents, which, as we used to say in Euclid, is absurd. The president had also some pertinent remarks to make on the subject of the hungry child, who has bulked very largely, and with justice, in the eye of the public during this last parliamentary session.

The discussion on Esperanto was a big compliment to the teaching profession, for it was declared that the new *lingua franca* will never be a success till it is taught in the schools. Truly teachers ought to be a proud race, for everybody wants them. From the defence of the country by training the youth of our schools to shoot with air-guns, to bringing about the millennium by means of a universal tongue, every reformer invokes their aid. We think Dr. O'Connor has indicated the one means by which Esperanto could be spread. Whether that would also ensure its success as a universal language is another question. But we doubt whether Esperanto is likely just yet to find its place as an obligatory member of an already crowded programme.

Much more within the range of practical politics, and within the number of those things devoutly to be wished, is Mr. Storey's proposal to raise the age of exemption from school to thirteen, with a further rise to fourteen as soon as possible. Mr. Storey comes from Lancashire, and proposed his resolution out of the abundance of his experience. As for mixed schools, on which opinions at Conference seem to have been mixed themselves, the experience of the United States does not appear to justify pessimism.

The closing session brought a fine discourse from Professor Muirhead of Birmingham on ethical teaching in schools. Like Dr. Adler of Philadelphia, he would use, as his means, literature and history, the subjects that deal with what is admirable in human life. He claimed that character could be influenced by such lessons, and a love for what is beautiful, inspiring, and virtuous inculcated. Every enthusiastic teacher of literature or history, every earnest class master or mistress, does this, of course, incidentally. But there must be something lacking or unresponsive in the Anglo-Saxon mind, for the idea of a *systematic* course of ethical instruction always strikes coldly in this country. How unjustifiable this state of mind is can be seen from the success attending such instruction among our cousins the Americans, and among our neighbours and friends the French. Certain it is that English education of every kind shines by its influence on character, and this character formation as part of school life is first in every Englishman's mind; so that any attempt to intensify this effect through a training in reverence, in admiration for what is lofty and noble, by such a course of instruction as that proposed by Professor Muirhead and others, ought to meet with warm sympathy.

III.—The Bradford Meeting.

The North of England Educational Conference held its fifth annual meeting in Bradford, under the presidency of Sir Albert K. Rollit. The attendance of delegates, consisting mostly of managers and teachers, was well up to that of former years, and the subjects chosen for discussion were full of interest. The general note was highly practical. The demand was for simplicity in curriculum and method.

The president, at the outset, associated himself with the municipal principle in the Education Act of 1902. Municipalities had already dealt well with technical instruction at a time when, through indifference of Governments and Parliaments, they were expected to distil wisdom from whisky, genius out of gin, and business from beer. To-day they felt very much between the bayonet points of opposing politicians. He urged that England should take serious notice of the educational work which other countries were doing.

He was further of opinion that in the past we had overdone the dead languages, abstruse sciences, and

the arts most remote from daily life. He laid special stress upon the teaching of English and modern colloquial languages, and he urged the delegates to help in uniting commerce with culture, and in making commerce a learned profession. Lastly, he put in a plea for direct education for the public life of the country.

The Rev. W. H. Keeling, M.A., headmaster of Bradford Grammar School, contributed a very important paper on the best curricula for secondary schools. He said the present disquietude, compared with past apathy and indifference, was encouraging. Up to recent years there were two hostile schools of opinion —the supporters of a classical education and the old *régime*, and the supporters of a vague utilitarianism in education. Both were defective: classical education was rarely found in its old perfection through crowding the curriculum with every imaginable subject, whilst its divorce from English literature and general culture made it, as a rule, a barren study. The purely utilitarian curriculum was no education at all.

No strict line of demarcation of subjects could be drawn between elementary and secondary schools. The difference lay rather in the character of the teaching. The standard to be aimed at should be one just short of the university. The curriculum of the secondary school falls into two divisions, intimately connected, though still distinct—namely (1) up to the age of specialisation, with common range of subjects; (2) period of specialisation.

In the curriculum of the former there should be moral and religious teaching, physical training (not military), elementary mathematics, history, geography, and, most indispensable of all, English, which should be taught to foster a literary sense. It was here that the secondary school was superior to the elementary, from being able to command the services of men of a wider and more literary education. Other subjects which demanded a place were French, Latin, natural science, drawing, and music. French should precede Latin, and physics, closely connected with mathematics, should precede chemistry. French and Latin, after the first two years of the Board of Education course, should be lightened, to give place to German or Greek.

The period of specialisation should begin at fifteen. The term specialisation was misleading. Nothing in the nature of absorption in technical detail could be admitted into schools. The subjects themselves must be broad. Among such subjects first and foremost came classics, the widest of all subjects—the key to the highest and best thoughts of the world; modern languages, taught in relation to their literature; mathematics; science. Throughout the whole, true education, not mere equipment for livelihood, must be the aim.

A second paper on the same subject was read by Mr. R. Lishman, headmaster of the Belle Vue Secondary Boys' School, Bradford. He said that the new type of school—the municipal secondary school—aimed at equipping pupils more intelligently for the practical life of industry and commerce by broadening their outlook. The curriculum should aim at securing an all-round development by appealing to every side of a child's nature, and developing every latent power. Special aptitudes should be encouraged to bring out individuality, and manual training should be treated as important. More attention should be paid to instruction in the rights, duties, and responsibilities of the citizen.

Miss G. M'Croben, M.A., headmistress of the Girls' High School, Wakefield, read a third paper on the same subject as it affected girls' schools. She observed that their aims as educators were general, and not preparation for any trade or profession. Their chief aim was to cultivate a desire for knowledge rather than to overburden their pupils' minds with facts. She regarded English as of fundamental importance. "If," she said, "we can help the girls to express themselves well, to write their own language, and to appreciate the best English literature, they will be dowered with a gift for life which will be invaluable."

In science every girl should learn the laws affecting herself and her bodily structure, laws of health and hygiene, and some physiology. Considering their possible future, girls should know something of their responsibilities, and of the care of home and children, which might fall to their lot. Miss M'Croben also thought that cookery would be best taken up not earlier than the age of sixteen.

A general discussion followed. Dr. Forsyth of Leeds Central Higher-Grade School said what was still wanted in England was public faith in the value of education. Mr. Gore, headmaster of Hymers College, Hull, said a great loss in the modern system was the disappearance of the old form-master idea, and the substitution for it of instruction by specialists. Nearly all the speakers admitted the necessity of giving more time to science and modern languages, but there was some difference of opinion respecting the value of grammatical instruction in teaching the latter. The conversational advocates seemed to preponderate. Several reverend gentlemen bewailed the necessity of sacrificing the humanities to the utilities. All were unanimous on the insistence of more attention to English composition and literature, as well as to correctness of speech.

Miss Foxley gave expression to some high ideals in the matter of curricula for primary schools—ideals which the bulk of her professional comrades evidently thought out of reach under existing conditions, especially taking into consideration the size of classes. Mr. Sykes showed a way in which such ideals could be realised, but, on his own admission, it would be an expensive way. He advocated the cutting down of the number of scholars in a class from sixty to twelve; but more than one teacher admitted that this was an impracticable as well as an educationally unsound suggestion. All were agreed that one of the first reforms needed was a considerable reduction in the size of classes in the elementary school, but much fear was expressed that the long-suffering ratepayer would not stand the strain.

A very thoughtful and earnest gathering assembled in the architectural room of the School of Art to discuss the training of the colour sense in children. This was distinctly a women's section, for not only was it presided over by Miss Gregory, but the conference was almost entirely composed of women. Mr. Stephenson, who, as principal of the Bradford School of Art, was listened to with special interest, dealt with the decadence of the colour sense in relation to the modern commercial spirit. This was humorously illustrated by Dr. Thomson, with a story of the sturdy denunciation of art by a neighbour of his, on the ground that there was "no brass in it."

The Modern World

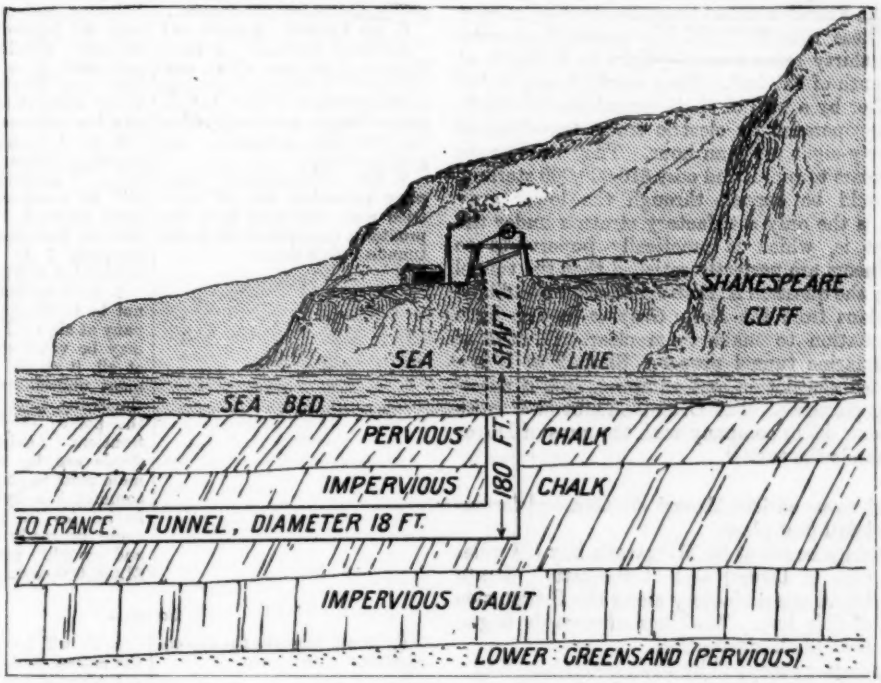
In this column the Editor hopes to offer, month by month, notes on interesting current topics, presented in such a form that the subject-matter can be readily used for class instruction. These notes will also, it is hoped, prove useful to student teachers who are expected to answer questions in up-to-date General Knowledge.

GEOGRAPHY NOTES UP-TO-DATE.

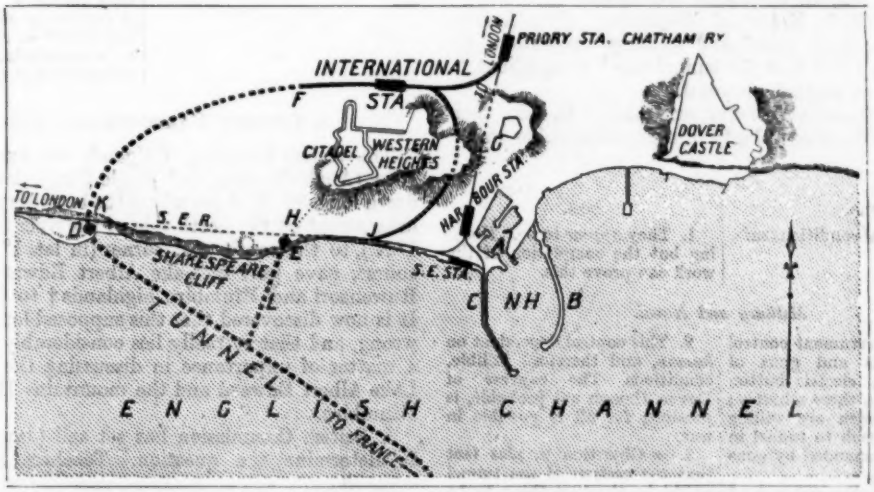
BY E. R. WETHEY, M.A., F.R.G.S.

The Channel Tunnel.

THE scheme of a Channel tunnel, which is once more shortly to occupy the attention of Parliament, is intensely interesting to those geography teachers who



Plan 1—showing the position of the existing shaft and the various strata beneath the sea.



A, Commercial Harbour. B, Prince of Wales's Pier. C, Admiralty Pier. D, Shaft 1. E, Shaft 2. F, Entrance to tunnel. G, Drop Redoubt. H, Electric communication between Citadel and the water traps. J, Point where continental passengers will branch off from the existing S.E. line for the International Station. K, Point where S.E. line passes over tunnel. L, Emergency tunnel. N H, National Harbour.

Plan 2—showing the junctions by which communication will be effected between existing railway lines and the proposed tunnel.

(By the permission of the "Daily Graphic.")

are concerned with the military and commercial branches of their subject. A thorough study of the question would involve an inquisition into a large number of problems connected with geology and engineering, commerce and politics. Here we only propose to offer a few notes on the proposed scheme, its history, and its chances of success.

The Scheme.—Briefly put, the idea is to build two tunnels (an up and a down line, connected with each other at intervals of a quarter of a mile), starting on the English side from just west of Shakespeare Cliff, and finishing on the French coast at Sangatte, four miles west of Calais. These tunnels would run twenty-four miles under water, thirty miles from daylight to daylight, at an average depth of 180 feet. They would be separated from each other by a wall of chalk seventeen feet thick, and would be operated by electric trains travelling at a speed of forty-eight miles an hour. They would take six or seven years to build, and cost £16,000,000 sterling. Workings would be carried through the lower gray chalk, which is the only satisfactory stratum under the Channel—that is, which is practically impervious to water. Engineers are perfectly satisfied that the tunnel *can* be made; the question is, Is it expedient to build it?

The two plans from the *Daily Graphic* require little further explanation to make them clear. Shaft 1 at D is the submarine tunnel proper. Shaft 2 at E is a smaller bore for ventilation and pumping, and, if necessary, flooding purposes. The Drop Redoubt at G is an important item: it, in company with the guns of Dover Castle, commands the tunnel.

History.—

1856, and even earlier, Thomé de Gamoud formulated first plans.

1866. Borings began at St. Margaret's Bay (3½ miles east of Dover) and at Sangatte. Strata found unsatisfactory along the British side of this line. Workings afterwards begun near Shakespeare Cliff.

1870. Operations stopped by Franco-German War.

1875. French and English companies formed, after official Government sanction.

1883. British House of Commons, after hearing much naval and military opposition, decided that the tunnel was "inexpedient."

1906. The present proposal.

Pros and Cons.—We leave our readers to take their own sides. There are plenty of arguments either way.

Scientific.

PRO.	CON.
1. Geological conditions safe.	1. They *appear* to be. Nothing but the completion of the work can prove this.

Military and Naval.

2. Easy Government control by redoubt G and guns of Dover Castle; electric button floods tunnel in three minutes; moreover, French are willing to build approach to tunnel in a position commanded by guns of British fleet.	2. This control dependent on *human*, and therefore fallible, conditions. The capture of Dover, though not probable, is possible, for all is possible in war.
3. Food supplies guaranteed in time of war.	3. = Objection 2, *plus* fact that the cession of the tunnel would be the first thing to be demanded after a disastrous war.
4. When aeroplanes come into existence, five or six tunnels will make no difference.	4. Aeroplanes in war as yet hypothetical. In any case, Great Britain would lose its insular position; the army would have to be greatly strengthened to defend the tunnel, or recover it if lost, and the whole conditions of British defence would be altered.

Commercial.

5. (*a*) Immense development of trade when Paris and Brussels are brought within four and five hours of London; (*b*) probable passengers alone estimated at 1,500,000, and profits £1,250,000 per annum.	5. (*a*) Certain trades may develop — for example, small perishable articles, but not heavy and bulky goods, which will still go by water, the cheapest means of transit. Shipping and other industries may be injured;* (*b*) questionable whether passengers will flock to a tunnel where they may be drowned, blown up, or asphyxiated in the space of a few minutes.
6. (*a*) French gauge of "Northern Railway" a mere fraction of an inch wider, and rolling-stock of every country, except Russia and Spain (whose gauges differ materially from the British) available; (*b*) gradients easy.	6. (*a*) French gauge and rolling stock different from British, hence "breaking-bulk" will still be necessary; (*b*) maximum gradient, 1 in 55, is very stiff for fast traffic. Compare Simplon, 1 in 145, and St. Gothard, 1 in 172.
7. The international company promoters are all well-tried men, and they have the profitable example of the Swiss tunnels before them.	7. Such an enterprise should not be in the hands of a company at all, for British interests may be voted down. If built at all, it should be a Government undertaking. Moreover, the Swiss tunnels are not to the point; they do not alter frontiers. Again, good dividends are by no means the main point to consider. Better commence a system of train ferries (as in U.S.A.). They could be ready in two years, and would cost less than £1,000,000 each.

Social.

8. It will improve the *entente cordiale*.	8. It will have no effect on the *entente cordiale*, which does not depend on propinquity. Moreover, France is not the only nation at the other end. A surplusage of cordite at our end would be always necessary to counterbalance a shortage of *cordialité* at the other!

A Curious Cartographic Mistake.

The western boundary of Uganda was fixed in 1890 and 1894 (Anglo-German and Anglo-Congo treaties) to run down long. 30° E., from where the boundary left the great escarpment on the north side of the river Semliki (in lat. 1° N.), to the south-west corner (in lat. 1° S.). This, of course, gave part of Lake Albert Edward and all the Ruwenzori and Mfumbiro highlands† to Great Britain. It is now discovered that this supposed long. 30° E. is all wrong, and that it really lies considerably to the east—a matter of importance in discussing the ownership of Lake Albert Edward and the mountains Ruwenzori and Mfumbiro.

A British Commission has set sail (January 5, 1907) to determine the question. Teachers should watch

* Although imports into the United Kingdom from France have increased from a value of £37,000,000 in 1886 to one of over £50,000,000 now (in spite of there being no tunnel), the exports are practically stationary (tariffs?). Tunnel will benefit our competitors rather than ourselves.

† These are the mountains known as Kirunga among the native tribes to the south, but as Umfumbira (according to Major A. St. H. Gibbons) by the Waganda. Umfumbira appears to mean "Cook-house"—the whole mass is volcanic.

developments, if they mean to keep their atlases up to date. The best natural line (according to the well-known authority on that district, Mr. Douglas Freshfield, writing in the *Geographical Journal* of November 1906) would run along the river Semliki to where it leaves Lake Albert Edward, skirt the lake on the *east* side of the southern portion, follow the Rutshuru Valley and the present boundary so as to include, of course, Mount Mfumbiro, and finally bend east down the river Kagera.

The whole question is interesting, especially in view of our Government's decision—as enunciated by Sir Edward Grey recently in the House of Commons—that

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— · — · — Boundary as in the atlases (*i.e.* including the supposed long. 30° E.).
— — — Recognised position (now) of long. 30° E.
G. E. A..... German East Africa.
Mt. M..... Mt. Mfumbiro.
R. R..... River Rutshuru.

geography is no longer to be even an optional subject in the examinations which admit candidates to the diplomatic service of the Foreign Office. They can pick up the subject in the course of their business is the argument. So they can; and the nation pays for their mistakes!

CURRENT EVENTS CONNECTED WITH HISTORY.

BY E. M. WILMOT-BUXTON,
Author of "Makers of Europe," etc.

The Dissolution of the German Reichstag.

ON December 13 the Reichstag, the popular representative Chamber of the German Parliament, openly defied the Government—that is to say, the Emperor and the Federal Council—and was promptly dissolved by a peremptory message from the Kaiser. The importance of this event turns on the vital point as to whether the government of Germany is to be constitutional or absolute in character; and in this action the voice of the country has made itself clearly heard. The matter under discussion is the maintenance of troops for the protection of the colonies; and the country, as represented by the Reichstag, refuses to rise to the oft-repeated cry of "The honour of the national flag," and asserts its right to have a voice in the management of affairs, instead of giving a passive assent to a policy dictated by the ministers of the Federal Council, who are responsible only to the sovereign.

The weakness of the Reichstag and the strength of the Ministerial party arises from the fact that the present form of government only dates back to 1871, the year following the Franco-German War, when the one safety for the disunited German states lay in a strong central power, vested in the Emperor and the ministers who represented the Governments of the different states; which state of things was effected by the imperial policy of Bismarck. This is only the eleventh Reichstag that has as yet been summoned, but it is not the Assembly's first bid for independence.

In 1886 a strenuous resistance was made to the Emperor's determination to add largely to the strength of the army in time of peace, but the genius of Bismarck easily secured a victory for the Government. Now that there is no Bismarck to the fore, the issue of the present struggle will be extremely interesting and important. Considering this event in the light of English history, we note first that the method of procedure in the dissolution is reversed; for in Germany, when the Government is defeated by the popular representative Chamber, it is not the Government which resigns, but the Parliament which is dissolved.

A very strong similarity exists between the situation of Germany at the present time and that of England under the Stuart kings, whose absolute policy was almost identical with that of the Kaiser at the present time. Between 1610 and 1624 James the First dissolved four Parliaments, and during the next three years Charles the First dissolved three more, solely because the House of Commons rebelled against an attempt at absolutism.

The French Government and the Pope.

The Church in France has been ordered by the Pope to defy the decision of the French Government to treat the Church as a mere department of the State, claiming a right over all ecclesiastical buildings and property, and regarding the assembly of congregations for worship as ordinary public meetings. This quarrel between Church and State dates back to the days of the first French Revolution, when a determined effort was made by the Republic to drive religion from the land. Priests were proscribed, hundreds of them were guillotined, and churches and cathedrals were used for public assemblies of all kinds.

After these troubled years, the temporary restoration of the Empire brought about a kind of armed neutrality between the ecclesiastical and political powers; but the anti-clerical tendency of the Republican Government has been clearly marked of recent years by the secularisation of education, and by the dissolution of all religious houses which would not submit to State inspection and regulations.

The action of the Pope, however, in commanding open defiance, has been severely criticised on both sides. A French priest, whose sympathies are, of course, entirely with the ecclesiastical party, sees in the situation a striking parallel with the affairs of England at the Reformation period. In those days, he says, the Pope made the mistake of demanding that he should be placed above kings, and thus he lost his hold on the English Church. Now he demands that his will should rule that of republics; and the result, even if it does not lead to a war of religion, is bound to be disastrous to the Church in France.

The position of affairs reminds us, also, of the action of the Pope in 1570, when he ordered active defiance of the English Government by releasing all Papist subjects

from their allegiance to Elizabeth, and thus set on foot a series of plots and insurrections which narrowly escaped developing into a civil war.

Affairs in Russia.

The assassination of Count Ignatieff on December 22 marks another attempt on the part of the revolutionary party to put an end by force to the unwieldy machinery of the ancient *régime*. It is significant that Count Ignatieff was a steady opponent of the historic "October Ukase," which granted representative government to Russia.

The circumstances of the incident bear a strong similarity to those of the assassination of the Duke of Buckingham, who supported the absolute policy of Charles the First against the "popular" party. He was murdered by Felton at Portsmouth in 1628 while fitting out a second expedition to aid Rochelle.

Condemnation of Admiral Niebogatoff.

Sentence of death has been passed on Admiral Niebogatoff for failure and cowardice at the great sea battle of Tsushima during the Russo-Japanese War. This has since been commuted to a sentence of ten years' imprisonment.

The execution of an unsuccessful general was the universal rule in ancient Carthage, but in modern English history the most striking instance is that of Admiral Byng, who, in 1756, refused to fight a French squadron, in force slightly superior to his own, which was besieging Minorca. Byng was made the scapegoat of the feeble administration of Newcastle, which had already led to disasters in America and India. He was tried by court-martial, condemned, and shot on the quarter-deck of the *Monarque* at Portsmouth, on March 14, 1757. It was in connection with this event that Voltaire wrote that, in England, "it is found requisite, now and then, to put one admiral to death to encourage the others." It is certain that, from that day, the unequalled efficacy of the British navy may be said to date.

The Discontent in the Navy.

The attempts at a recurrence of insubordination shown by the stokers at Portsmouth Naval Barracks during December, slight as they were, remind us somewhat of the terrible danger which threatened this country in 1797 from the mutiny at the Nore and Spithead.

England was at war with France and Holland. Her only chance was to keep the French and Dutch fleets shut up within their ports by a series of blockades, which kept the bluejackets perpetually at sea in very trying circumstances. The pay was bad, the food was worse, and the discipline of their commanders was harsh in the extreme.

Mutiny first broke out in the Channel Fleet at Spithead. This was, however, speedily ended by the wise action of Pitt, who sent Lord Howe, the hero of the first of June, with the king's pardon in his hands, to address the recalcitrants.

A more widespread mutiny then broke out at the Nore. It was largely fanned by a sailor named Parker, whose ready tongue and fiery temper had worked up the sailors to frenzy.

Once more Pitt acted with unerring tact. Parker was seized and hanged, and a free pardon was offered to all those who would return to work without further conditions. At the same time an Act was passed securing better wages, the very real grievances of the sailors were redressed, and since that time a mutiny in the navy has been almost unknown.

MODERN INVENTION.

BY ARCHIBALD WILLIAMS,
Author of "How it Works," etc.

The Principles of the Flying-Machine.

ABOUT a century ago Trevithick proved that a smooth wheel, rotated by steam, set up sufficient friction against a smooth rail to give useful tractive power. From that time dates the era of the practical steam locomotive. Within the last few months it has been proved by M. Santos Dumont that the air affords sufficient support to a well-designed flying-machine heavier than air to enable it to rise from the ground and travel in any direction. So the year 1906 will probably be regarded as the opening of the era of the flying-machine.

Now that experiment has reached the stage of partial success, public interest in the problem of human flight has been greatly stimulated. We appear to be on the verge of a revolution in the modes of swift travel, and, consequently, in the conditions of our social life.

In this and the following chapter we shall consider briefly some of the facts which experimenters have established, and the lines on which the construction of aeroplanes (as flying-machines are now somewhat loosely called) will probably proceed.

What an Aeroplane is.

As at present developed, a flying-machine may be said to consist essentially of (1) an engine to work one or more propellers, which exert a driving thrust against the air; (2) a set of supporting surfaces set at an angle to the axis of the propeller, so that when driven forward they strike the air obliquely and tend to overcome the force of gravity; (3) some device for maintaining the balance of and for steering the machine.

It must be strongly built and rigid, and the power of the engine must be great in proportion to the total weight of the machine. Thanks to the development of the petrol motor and to the toughness of steel and other substances, the experimenter has at command the materials necessary for the construction of a successful aeroplane. It is with regard to the proper disposition of these materials that his chief difficulties occur.

Some Simple Experiments.

Since the flying-machine depends ultimately on the effect of air upon surfaces striking it obliquely, let us make a few simple investigations into this subject. For our purpose we need only an oblong sheet of stiff paper, a needle and thread, and a few split shot, such as an angler uses to weight his floats with.

For convenience' sake we will name the four edges of the paper N, E, S, and W respectively; N and S being the short, and E and W the long edges.

First we hold the paper level, and drop it. It wobbles in all directions as it falls, and possibly even turns over. Why does it wobble? This needs a little explanation. Draw two diagonal lines from corner to corner. They divide the surface into four equal parts, and the point at which they cross is the centre of gravity of the paper.

When we drop the paper, one edge, from some cause

or another, is sure to sink lower than the rest. Let us assume that the N edge does so. The force of gravity tries to pull the paper down quite perpendicularly, but the resistance of the air to its now oblique surface makes it slide in a S to N direction. As the speed of descent increases, the air resistance grows greater at the N than at the S end, because the N end comes on undisturbed air, whereas the other end slides on to air that has already been given a downwards push by the N end, and therefore offers less support. So the "centre of pressure," or support, as it is called, now lies between the centre of gravity and the N end; the S end gradually drops, and the paper reverses its movement. Then perhaps the E side sinks, and the paper slides from W to E. And so on. Very slight variations in air resistance, such as arise from currents, suffice to cause tipping and change of direction, as the centre of pressure alters its position relatively to the centre of gravity. The flat sheet has no stability.

Increasing the Stability.

We now take the sheet, fold it down the middle from N to S, and flatten it out again until the E half makes a slight angle with the W half.

It is then dropped, angle downwards. It still wobbles N and S, but not E and W. The air, being deflected E and W by the angle, presses equally on each half. If the E edge tipped over ever so little, that half, through lying flatter to the air, would offer greater resistance than the other, and the other would sink and restore the original position, and *vice versâ*.

The stability of our aeroplane has therefore been increased laterally; but longitudinally it wobbles as before, since the centre of pressure can still shift N and S of the centre of gravity.

It will be easy to remedy this to a great extent, and also to force the paper to travel in a fixed direction.

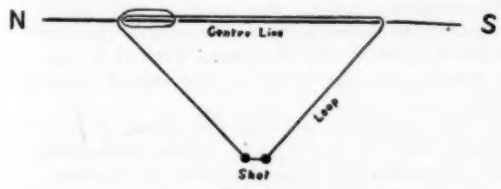


FIG. 1.

We take the needle and thread and pass them through the centre line as shown in Fig. 1, making a loop below. To the loop we affix a couple of shot. By pulling the thread about through the paper the position of the shot can be altered.

We then adjust the shot so that when the loop is taut

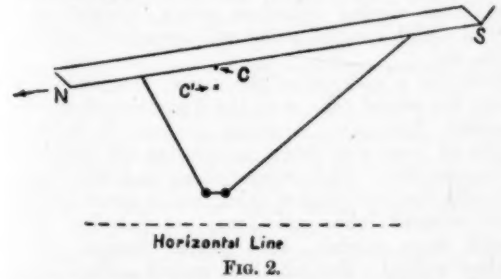


FIG. 2.

they, and consequently the centre of gravity, are nearer the N end of the paper than the S (Fig. 2). The paper is dropped. Instead of wobbling N and S as it did, it slides more consistently in a N direction, because the centre of pressure now more nearly coincides with the centre of gravity—that is, there is more support at the end where there is most weight—and the S end does not sink.

Matters may be improved still further by cutting the N end to a point (Fig. 3). If the shot be carefully

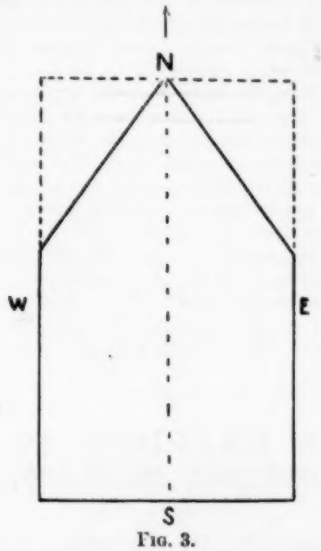


FIG. 3.

adjusted, the forward travel considerably exceeds the vertical fall.

Steering.

Snip off a strip along the W edge (Fig. 4). On being

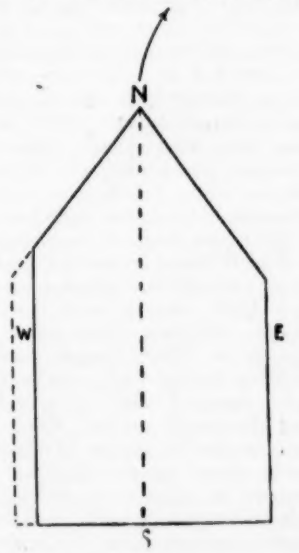


FIG. 4.

dropped, the aeroplane describes a falling curve towards the E.

Summary.

Three facts are established by these experiments:—(1) That lateral stability may be increased by inclining

the wings of the aeroplane upwards; (2) that longitudinal stability is maintained by making the centre of pressure continually coincide with the centre of gravity; (3) that steering is rendered possible by altering the balance laterally.

Conclusion.

If, instead of shot and paper, we had a man resting on a platform attached rigidly to large supporting surfaces, we should expect that he might learn to shift himself about in such a manner as to counterbalance any tipping of the "prow," and to make the aeroplane swerve to right or left as he wished.

This has actually been done by experimenters—by Lilienthal in Germany, Octave Chanute and the Wrights in America, among others—who have made repeated oblique descents from an eminence on "gliding machines." The brothers Wright succeeded in travelling six feet forwards for every foot of vertical descent.

So far we have considered only the behaviour of flat surfaces drawn downwards through the air by the action of gravity. In the next chapter our attention will be turned to the most effective form of sustaining surfaces, and to the mechanically propelled aeroplane which is able to raise itself as well as to advance.

GREEK SCULPTURE IN THE BRITISH MUSEUM.

II.—THE PARTHENON MARBLES (*Continued*).*

The Story of a Famous Procession.

THE Greeks took a passionate delight in gorgeous processions, which were sometimes associated with political events, sometimes with civic celebrations, and, most frequently of all, with religious observance.

At Athens itself the most celebrated festival could be traced back to remote ages, tradition asserting that Theseus had instituted it in order to draw together once a year the citizens from the surrounding states under the leadership of Athens. But, in accordance with the usual tendency in past ages, this festival gradually developed into a religious observance, which reached its climax every fourth year. It was known as the Panathenaic festival, distinguished on ordinary occasions as the Lesser, and on every fourth year as the Greater Panathenaic, when the procession was marked by every circumstance of pomp and ritual.

Unless this is clearly borne in mind, it will be difficult to appreciate the sculptures that come next under consideration. In the "Old Temple" that stood on the Acropolis close to the Parthenon was an ancient wooden Athene, regarded with the utmost reverence by Athens and the foreign states. Every fourth year a new robe was carried in solemn procession from the city below to be placed on the knees of the goddess. The most honourable maidens were engaged in the weaving of this dark violet (or, perhaps, saffron coloured) robe, upon which was interwoven the story of the fight between the gods and the earth-born giants, Zeus (Jupiter) and Athene appearing side by side fighting against the rebellious monsters.

Let us imagine the scene as it appeared in the fifth century before Christ. Preparations were made weeks beforehand. As the birthday of the goddess approached, the most honourable citizens from the surrounding states came along all the roads leading to Athens, dressed in their finest robes, and accompanied by their bodyguards. Travelling more slowly towards Athens were the priests and their attendants, leading by slow stages the sheep and oxen selected for sacrifice to Athene. All Athens was in movement, the streets decked brilliantly for the festival; while musicians, dramatists, poets, singers, and athletes from foreign cities were received with the honour due to their fame. And now the day of days broke. From early morning the streets were alive with crowds of the poorer Athenians and of the strangers who had come to observe the festival, while in the fields outside the city a gorgeous company was assembling to take part in the procession. Here the marshals, with their staffs of office, were moving hither and thither, conducting each to his or her place according to traditional arrangement.

At length the procession began to move from the fields towards the city, lined with its crowds of proud Athenians. At the head of the moving stream of the celebrants, and raised to a good height, was the sacred robe itself, stretched from the mast and yard of a ship drawn on wheels. In solemnity the scene must have approached those mediæval processions on the Continent, when the sacred relics were borne through cities with every rite and ceremony that could enrich the moment; while gorgeous raiment, singing, and instrumental music subdued the minds of the onlookers, and tuned them to accord with the solemn occasion. So the Greater Panathenaic procession made its way through the lower city, and then wound slowly up the hillside towards the Acropolis, which at length it entered through the glorious marble gates, the Propylæ, flanked with that gem among buildings, the Temple of Victory.

Doubtless the hillside was crowded with people, and the procession must have passed round the Acropolis through a dense throng of citizens, excited by the sights and sounds, yet awestruck by the solemn accompaniments.

As the procession entered the gates, it would be gradually lost to the citizens below, who would yet follow its course round the Acropolis by the slow movement of the sacred robe, seen, in part, above the great surrounding walls of the citadel. They would trace it as it passed the brazen statue of Athene, fully armed with helmet, shield, and spear—a statue sixty feet in height, looking over the city, and seen far out at sea by the sailors, who saluted it reverently while they guided their ships by its helmet towards the harbour. So the fishermen on the French coast cross themselves before the wooden crucifixes which, erected on the crest of a cliff, seem to guide and protect the wayfarers on the sea.

Think for a moment of the varied procession. Following the sacred robe were the daughters of the most honoured Athenians, carrying baskets of food and flagons of wine and other implements for use in the coming sacrifice. They moved slowly and with dignity, each with her hair lying in thick tresses about her neck. Their coloured robes were long, yet just free of the ground, their sandals, with purple thongs, showing as they walked. Behind them moved others bearing cushioned stools on their heads. Then followed the magistrates, upon whose shoulders rested the responsi-

* The illustrations are from lantern slides published by the Trustees of the British Museum. They can be borrowed from the London County Council by teachers in its employ wishing to give lessons preparatory, if possible, to actual visits to the British Museum.

bility for the orderly observance of the festival. Next came a troop of cows and sheep with their escort, each cow having two attendants, and each sheep a boy. Immediately behind them followed the bearers of bronze or silver trays, oblong in form, and containing cakes and other foods for use in the sacrifice. It was an honour even to be an attendant in Athene's festival, and these various bearers of trays, vases, and water-pitchers were probably men of some importance in Athens or her sister cities.

The animals doomed to death thus passed on with priests and attendants, while behind came the musicians, the players upon the double pipe and the harp, the music of which doubtless formed an accompaniment to hymns sung by the priests and lyrists in honour of the great gods. For it will be seen that, though this day was primarily set apart for the worship of Athene, the powerful deities associated with her in mythology were also included in the celebration.

Still it was emphatically Athene's day; no circumstance was omitted that might punctuate the love and honour of her favoured citizens. For immediately following the oxen, the sacrificial vessels, and the musicians, were the grave, bearded, elderly Athenians, each bearing in his right hand a branch of olive, the tree sacred to the goddess, since, as we have seen, it first sprang from the ground at the stroke of her spear.

closely girded. The right shoulder and breast were bare, "and they carried an axe in the right hand. The bulls were followed by a crowd of other victims, each kind being led separately and in order. Meanwhile flute and pipe were playing a melody, which was, as it were, an introduction to the sacrifice. The cattle and their escort were followed by maidens with flowing hair. They were in two groups. The first carried baskets of fruits and flowers, the second troop carried flat baskets with sweetmeats and incense, and filled the place with sweet smells. They bore their burdens on their heads, leaving their hands free, and kept their ranks.....that they might march and dance.....singing a sacred hymn as they passed onward.

"But at length the appearance of the youthful cavalry and of its leader proved that a noble sight was better than any music. There were fifty young men.....their boots were laced with purple thongs, and tied above the ankle. Their cloaks were white, with dark-blue borders, and were fastened on their breasts with golden brooches. The horses were all Thessalian, and breathed the freedom of their native plains."

The Sculptured Procession.

Let us recall the Parthenon in its pristine state. As one came through the gates of the Acropolis he would see the temple to his right. Passing up the temple

Parthenon Frieze (East End).

[Gods and goddesses waiting to receive the procession. Between them is a group of mortals. The high priest is folding up the sacred robe of Athene. Two maidens carry stools, probably for the immortals supposed to be present in the temple.]

There was a fitting, an almost awe-inspiring dignity in this, the essential procession, for what followed may be considered the embroidery, the ornament, a glorious setting, but not the heart of the ceremony. For that, above all, was the presentation of the robe to the goddess, a deed that must needs be accompanied by sacrifice.

So far the procession moved slowly behind the creaking rollers upon which the ship moved; while the lowing and bleating of the oxen and sheep broke in plaintively among the sounds of hymn, pipe, and lyre. But now, probably separated by a long interval, came the war-chariots, with their restive horses, the splendid creatures impatiently pawing the ground, and rearing against the restraint of the youths who, with their round shields, walked in front, apparently checking the horses by occasionally confronting them with their shields. It must have required every care on the part of the charioteers to keep these nervous thoroughbreds in order among the excitements of singing, music, and, perhaps, the shouting of the people. And, lastly, a fitting conclusion to the scene, came a gay cavalcade of noble Athenian youths on horseback.

A commentary on this glorious procession is to be found in an ancient Greek writer, Heliodorus, though he is describing only an embassy at Delphi. The procession there was led by the priests, with white tunics

steps and between the pillars, he would catch sight of a sculptured band of marble near the top of the wall of the temple, and running round the entire building. It was, in fact, a vivid representation of the great festival described above.

The procession may be said to start at the west end, where youths were seen preparing to mount; while, from the centre, horsemen start to the right and left towards the long north and south walls respectively. There were thus two streams passing along towards the east, where the procession ended. So that, passing from the east down either side, one met the maidens, the oxen, the musicians, the elders, the charioteers, and the horsemen in that order. Much of this noble sculpture was destroyed in the explosion which wrecked the Parthenon; part has been lost; but a great many blocks are now jealously kept in the British Museum, forming, with the sculptures from the pediment, described in our last paper, perhaps the most important collection in the world. It is necessary to reproduce photographs of only a few of these blocks to give a general idea of their treatment.

The first reproduction is from the east end of the frieze. It will be seen that to the right and left are seated figures much larger in scale than those standing in the centre. They are thought to represent the gods and goddesses who have come down from Olympus to

honour the festival of Athene by their presence. The deity to the left, leaning easily on his chair, is generally supposed to be Zeus (Jupiter); the goddess next to him, and raising her arm, is probably his wife Hera (Juno). There are several other deities to right and

Lowing Sacrificial Ox and its Attendants.

left, whose names must be largely conjectural. They sit awaiting the procession which approaches along the north and south sides. Probably they are meant to be invisible, and to be seated in a semicircle; while in *front* of them are the five smaller figures who epitomise the ceremony. A priest and priestess stand in the centre, the priestess helping to remove a chair from the head of a maiden, behind whom is another chair-bearer. The priest is folding up a cloth which he is receiving from a boy. The interpretation generally accepted is that the chairs are to be set out in order for the invisible gods, and that the cloth is the embroidered robe carried in the procession to be placed on the knees of Athene.

accomplished, as we have already seen, by seating the gods and goddesses, whose figures exceeded mortal size; and here again in this cavalcade the difficulty has been met with superb skill, without, at the same time, diminishing the importance and the scale. It will be seen that the horses are rearing. The effect of this, and of their curved legs, front and back, is to give life and movement, an effect which is increased by the different angles at which the horses hold their heads. Looking from one slab to another, from horseman to horseman, the horses seem to be veritably alive, eager to run, yet held in restraint by the horsemen, who show off the paces of their charges while maintaining an easy seat. There is just as much variety in the riders themselves. The exquisite variety of surface and the satisfying beauty of the design are matchless.

Among the crowd of horses, the sculptor has distinguished from perfect quietness, where the horse waits soberly to be mounted, to the most violent action, as in the next slab, in which the fiery action of the runaway horse is emphasised by the man's cloak flapping behind him in energetic folds caused by his rapid movement. Doubtless Pheidias did not carve the frieze entirely. An art student distinguishes easily some harsher handling among the more refined, but the unity in the design shows the master hand. One can understand the proud Athenian passing from contemplating the birth of Athene in the mighty sculptures in the east pediment, down either the north or south side, where, one after another, the incidents connected with Athene's festival came into view, satisfying the cultured Greek by the rhythm, the delicacy, and the close interweaving of the design.

The Statue of Athene in the Parthenon.

The temple of Athene, though simple enough in its rectangular plan, plain walls, and severe surrounding

Young Athenian Horsemen in the Procession.

The next photograph shows one of the sacrificial animals, a lowing ox, with his attendants. Even in its present broken state, the grace of outline in the creature, to say nothing of the delicate drapery and expression of movement in his attendants, faintly shadows the grace and refinement in the original. But for exquisite beauty in a frieze that counts among the world's finest possessions in art, no parts are more celebrated than the horses and horsemen that bring up the rear of the procession. It was a principle in Greek art to keep all the heads of the figures in a frieze nearly on a level. This the sculptor of the Parthenon (probably Pheidias)

pillars, was superbly ornamented by the sculptured pediments and by the magnificent frieze that has been described above, running like a ribbon of embossed gold around a jewel box. For there was veritable wealth within, artistically and intrinsically. In the inner chamber stood the colossal statue of Athene, forty feet high. Its fame spread through all the Greek colonies. Copies in small were common. It was engraven on gems and on leaden tickets and reliefs, so that, in conjunction with written tradition, some attempt may be made to imagine it as it stood in the holy place of the Parthenon.

It belonged to the class of statues known as *chryselе-*

phantine, because they were covered principally by ivory and gold, the ivory being used for the flesh, and the gold fastened on in plates to enrich the drapery.

REARING HORSE.

The effect must have been gorgeous, especially if we are to imagine the statue as "brilliant with costly metals, with ivory, and precious stones. To form an idea of the aspect, at once rich and imposing, of the statue in its sanctuary, we must bring before the imagination the columns of the *cella* decorated with shields and armour; the store of works of art, votive tablets, rich stuffs accumulated about the pedestal of Athene; the statue itself, resplendent with the sheen of gold and the dead white of ivory."

ANCIENT COPY OF THE GREAT STATUE OF ATHENE IN THE PARTHENON.

Athene stood fully armed, holding her spear in her left hand, which rested upon her shield. In her right hand she held a statue of a winged victory, six feet high.

From copies of the head on engraved gems, the helmet is seen to have been elaborate in construction. On the top, in the centre, was a sphinx, and on either side of this a winged gryphon. There was also a row of small horses at the front of the helmet. The almost barbaric splendour of such a helmet, covered probably with gold, was matched by the Medusa's head upon Athene's breast; while on the outside of the shield was sculptured the battle between the Greeks and the Amazons, and on the interior the fight between the gods and the earth-born giants. Even on the edges of the sandals the sculptor had represented a battle between the Centaurs and the Lapiths—the legendary struggle, that is to say, between the early Greek settlers and the wild aboriginal horsemen who opposed them.

When Christianity drove paganism from the shores of Greece, the Parthenon was converted into a church. The statue disappeared, having been probably destroyed for the sake of its gold and ornaments; for the Christian artists in the early centuries, to judge from their extant works, were quite unable to see the beauty of Greek art of the great Pheidian period.

There are three casts of statuettes in the British Museum from marbles supposed to be copies of the Parthenon Athene. It is hardly likely that in the original the clumsy column appeared, for this is entirely destructive of symmetry.

The warlike character of Athene is everywhere maintained. The very ornaments are representations of battles in which the goddess appeared personally or assisted her beloved Greeks. The pediments are eloquent of contest, and it was not without reason that the glorious procession of Athenians included war-chariots and cavalry. The Parthenon, rebuilt after the Persian wars, commemorated the valour by which the Athenians scattered their enemies by land and sea; it commemorated, at the same time, the divine power of the intellectual and warlike goddess by whose help they had saved the fatherland. W. E. SPARKES.

FAR AND NEAR.

INTERESTING ITEMS CHIEFLY FROM THE PERIODICALS.

TEACHERS who require first-class material for the little ones' story hour or for reading as a preparation for literature are recommended to use *St. Nicholas*.

The Literature of Childhood.

The November issue contains an accumulative fairy tale, entitled "The Good King," which deserves to become a nursery classic. The well-known authoress of *Little Lord Fauntleroy* is at present contributing to the magazine a series of original fairy tales, full of delicate fancy and of absorbing interest. Some of the poems and jingles are also of real literary merit, and this cannot be said of many poems written for the little ones. The section entitled "Books and Reading" is full of hints for teachers.

THE following interesting extract is taken from an article entitled "Memories of Maoriland" in the current number of the *Empire Review*:—

Soaping the Geyser.

"One of the curious sights of Wackarewarewa is the soaping of the Wairoa Geyser. This soaping of the geyser is done when any special visitors wish to see it, and permission has to be obtained from one of the Government officials at Wellington. The process is interesting. The permission being granted, an hour is fixed (usually about 3 p.m.); the spectators assemble at a safe distance, whilst a chosen few go with the caretaker and guides to the mouth of the geyser, which

is protected by a wooden cover. This is removed, and a bag containing two or three bars of yellow soap, shredded into small pieces, is handed to the lady who is to have the privilege of awaking the geyser from its sleep. The contents of the bag are shaken in, and then the spectators retreat out of range of the boiling spray. An interval of about seven or eight minutes is the quickest for the geyser to come into action, but of later years it takes longer. A roaring noise begins, and then the white foaming soap-suds rise and then sink rapidly. The water rises a few feet higher each time, falling again, and this is repeated many times till Wairoa attains its full energy, and in one magnificent upward burst it dashes into the air as if eager to meet the blue sky and brilliant sunshine after its long sleep in the earth's dark recesses."

MR. A. C. BENSON contributes an article to the *World's Work*, in which he describes an interesting experiment made by himself at Eton. The apparatus consisted of books containing reproductions of famous pictures, and Mr. Benson's aim was to arouse the interest of the boys in the masterpieces of art. Each boy had a book, and under the master's direction not only looked at but observed the pictures. "I never had a more absolutely absorbed class," we read, "and by the end of my course I found that there were a good many boys who were prepared to admit that there was a good deal of interest and pleasure to be got out of the careful study of pictures—even boys who, before my experiment, would have regarded pictures with Philistine indifference." Of course all depends upon the teacher. Few of us know our pictures as well as we ought to do, but there are many signs that picture-study will ultimately find its proper place in a complete scheme of education.

An Interesting Experiment.

HOW should literature be studied? It should be studied to get straight to the heart of the author—his thought and his feeling. Knowledge of historical and classical allusions and definitions of words are necessary to an appreciation of literature; but any chasing down of allusions for the sake of mere knowledge, any seeking out of the origins of words, any study of the life of an author when it sheds no light on the work in hand, is a waste of time, for it distracts the attention from the literature, and never allows the reader to catch the fires of a great creative spirit. So, too, while literature is the best instructor in composition, it should never be called upon to give this lesson until it has first unfolded its great truth to the reader. And there can be nothing more stultifying to a class than forcing these secondary matters to a prominent place in the study of literature, because, forsooth, they are the only things that can be marked and evaluated. How often a child in school is trained to dislike literature because he is made to spend his energy turning the leaves of a dictionary or some handbook, or learning the nauseating drivel to be found in some edited texts! When an instructor arrives at this stage of teaching where little things are seen out of all true proportion, his life has already fled, and soon the life of the class will flicker and die. Every student that makes details of supreme importance is like a near-sighted man studying some noble work of architecture. He may know the beauty of each individual column, the perfection of each pedestal and capital, the graceful lines of each window and door, yet this near-sighted man would have little sense of the strength and harmony of the whole. And there are many students in our classes making a myopic study of literature. Its minutest details are perfectly known, but the great, broad significance of its mighty unity is never dreamt of.—*W. F. Webster in "Teaching English in the High School."* (*Houghton, Mifflin, and Co.*)

Literature Study.

THE announcement that the Queen of Spain is a devoted Esperantist, and that Esperanto is to be added to the languages to be learned by the Norwegian Prince Olaf, has compelled even the most sceptical to admit that Esperanto is forging ahead. But the editorial declaration in the *North American Review* that Esperanto is certain to be the universal key-language of the future, and that therefore the *North American*, the leading periodical of the United States, will henceforth follow our example and devote space in every number to extend the knowledge of the language, is more important than the patronage of kings. A year or two more and Dr. Zamenhof will be entitled to the Nobel prize, for which he has already been nominated, as the inventor of the medium of communication between all nations that on earth do dwell.—*Review of Reviews.*

The Spread of Esperanto.

THE opinion of an English professor on the above subject will doubtless interest our readers. In his new book, *The Historical Study of the Mother Tongue*, which we notice elsewhere, Professor Wyld writes:—

"It is interesting to speculate as to the probable future of this movement. From what we know concerning the changes of languages, it seems probable that if this artificial language were really to become firmly established in all the civilised countries of the world, it could not long retain a sufficient degree of uniformity, either in structure or in pronunciation, to serve the purpose for which it was originally created. At the present moment there is a conventional pronunciation which can be approximately acquired, with fair ease, by the natives of most countries. But already every speaker must necessarily modify the sounds in a certain way, in accordance with the speech basis of his mother-tongue..... When once the language has been learnt, and has become a traditional form of speech, as is presumably hoped by those who advocate its use, its sounds will develop on different lines in every country.....Thus we should expect that in a few generations *Esperanto* will be different in each country, so far as the sounds are concerned."

A Professor's View.

AN article in the *World's Work* by Mrs. Fraser, on education in Japan, reveals the fact that all is not well in that best of all possible countries. Tokyo, it appears, is filled with young students of both sexes, anxious to obtain the "new learning." There are no authorised boarding-houses, and the young people, outside of class hours, are left to their own devices, with disastrous results, so we are told.

"In Tokyo alone there are ten thousand girls who have come from the provinces to complete their education. They are living in cheap boarding-houses, where no one takes any interest in them, and the results can only be called deplorable. Suddenly emancipated from home supervision, their heads filled with wild dreams of independence and of equality with men, their leisure hours occupied with the low class of romantic literature already described, what wonder that scandal follows scandal, and that the reputation of the Japanese girl for modesty and purity is being destroyed before our eyes?"

A Time of Transition.

HERE is a pretty little prose poem, taken from *C. B. Fry's Magazine*. The poet is the Hon. C. S. Rolls, who wooes the muse in a balloon, and views mun-

dane things from an Olympian height of two thousand feet.

"The Dear Little Planet."

"How pretty it looks! One sees it for the first time. The bunched woods, the shining face of the waters, the little hills, the calm valleys, the white cliffs and the red cliffs, the unquiet sea, the stretching sweep of corn, and the congregated cities under a haze of smoke. How different it all looks! One receives the impression of a perfect picture, the most harmonious combinations of colour and form, the completest rendering of creative faculty. And then, it is always changing. No balloon trip is precisely like another. The wind, we find, never takes us in exactly the same course. And even if we start always from the same place, and the wind is more or less in the same direction for a week together, still there is a real difference of view every day, and still the effect of moving over the scene presents and renders the earth in a fresh and newly beautiful fashion on every excursion. No; I assure you, until one has made a journey through the air one has never wholly realised the beauty and the charm of our little planet."

THE *Review of Reviews* for December contains the report of an interview with Miss Johnson, the head of the village school at Sompting, near Worthing, whose special method of work "is the teaching of the children by the constant use of the great fourfold instrument of popular culture—the drama, the dance, the song, and the pageant." The interviewer describes enthusiastically the method of employing the dramatic instinct in the teaching of literature, history, and geography. We have space for only one illustrative extract. Our readers are referred to the article itself. The lesson is geography, the subject Canada :—

The Dramatic Instinct.

"Now the children became animals, settlers, or Indians, the Indians wearing tablecloths to distinguish them from the others. First they hunted the beaver, shooting some and trapping others. Then the lumbermen come on the scene; trees are chopped down, and they explain that it is impossible to float them to the ports yet, as all the water is frozen. Presently the ice breaks up and the logs come floating down, carefully guided till they jam; then men break the ice; some of the men are hurt, and attended to. They tell as they go along what river they are floating down, what ports they are taking the logs to, and where they will be shipped, and what done with them. Before the logs are floated down, a trader comes on the scene, and they bargain in dollars for the purchase of the lot. Indians listen outside the shanty; as the trader leaves they bring skins, for which he gives them tobacco and beads. The lumbermen lie in wait for the trader and try to kill him; he escapes. Whilst they are away, the Indians enter the shanty and help themselves."

ALL teachers will enjoy the educational cartoons from *Vanity Fair* in the January *Windsor Magazine*. From the accompanying article we quote the following :—

A Unique Collection.

"It was told of Sir Richard Jebb how, during the Education Commission, he sat listening to the members while they debated whether the teachers of England should be described as 'a highly-trained and intelligent body of men.' 'Certainly,' said one enthusiast; 'are they not highly trained? Are they not intelligent?' 'Yes, but so are elephants,' said Sir Richard; and the matter dropped.

"A certain graduate of Christ's (a college that possessed a number of undergraduates of colour) took orders, and became a missionary. In some far hinterland he was duly received by a tribe of cannibals. Some prepared him for the stake, while others plundered his baggage, and in their search came upon a college blazer. The chief, rushing forward, embraced the missionary, crying, 'We were all there!' They were all Christ's College men!"

THE January *Journal of Education* is an exceptionally interesting number, though we wish the writer of "Occasional Notes" would annotate the phrase "the snakes of Iceland." Mr. Burrell writes on the pitfalls of the teacher of English, and rubs in some wholesome lessons. For example: "We have too long blamed the schoolboy and the schoolgirl, primary and secondary, for telling us that English classics and English subjects are dry. We ought to be proud of it. They are dry, for it is we who have dried and tinned them." There is a capital article on York Powell, followed by a charming one on Miss Beale, and some excellent "Thoughts on School Libraries," from which we cull the following grim sentence: "Do not wrap up the books in black cloth covers. A row of books in black is about as attractive as a row of undertakers, only less so, because the books stand still." The idea of undertakers' activity being attractive is excellent. The writer should really try again. Many of the *Journal* paragraphs are very light! If this continues, we will discontinue our subscription to *Punch*. Another enjoyable article is that by Florence M. Rushton on "Some Recitation Lessons."

An Excellent Number.

A HAPPY New Year and many of them to the *College Magazine*, the new venture of the L.C.C. Day Training College in Graystoke Place. The Principal gives it a "send-off" in a breezy little explosive note, inviting contributors to bring "their sparkling wit, their modernity, their delicate fancies, and their 'first-class matter.'" The first article, entitled "Luck," is also from his pen, and our readers will know how good it is. Naturally Mr. Goode's enthusiastic students must have some name for their local habitation, and "Graystokedom" is surely grim enough, suggesting a sort of ante-room to the region of which the most eminent topographers are Milton and Dante. The "star of Graystokeism" strikes us also as an inspiration. May the interesting little paper live long and prosper!

The Firstborn.

THE BACKBONE OF THE PRIMARY CURRICULUM.

BY "OBSERVER."

THE so-called elementary subjects—namely, reading, writing, and arithmetic—are in their first stages not elementary at all, and they are almost entirely alien to the normal activity of a healthy child. That the mental effort necessary to master the elements of these subjects is very great is a commonplace, not only of psychology, but also of practical pedagogy. And no formal beginning of any of the three ought, as a rule, to be made until at least the sixth year has been completed. Physiologists would say the seventh year, in view of physical changes. Possibly we shall come to this in due time.

The "Elementary" Subjects.

Watch the child at home as he goes about the business of the day, and note the things in which he takes a keen and living interest before he has been brought under the yoke of formal educational training. He is full of curiosity with regard to his immediate surroundings, and wants to know the reason for everything human and divine. If he is normally developed, his power of observation is strong and keen—so strong, indeed, that it is at times a nuisance both to himself and to

Observation of the Child.

others near him. (The trainer of children will do well to do what is possible to protect bright little ones from over-stimulation. "I cannot make my mind sit down," said a small child suffering from a school complaint which is often overlooked.) He is full of bodily activity, and throws himself whole-heartedly into the serious business we blindly call his "play;" and in this occupation he uses the facts gathered from his observations to form a basis upon which, by the exercise of his imagination, he creates an unreal world, in which he is the centre and moving spirit. Above all, he is pathetically eager to help his elders in any piece of work in which they may be engaged. Given a chance of making himself useful, in ever so small a way, he is perfectly happy.

He has a keen interest in a story told to him, provided that the details can be roughly imagined on a basis of familiar facts, and is gravely critical of discrepancies and careless thinking on the part of the narrator. He will at times tell you a tale of his own, some of the details of which you can trace to his experiences, while others raise questions to which there is seemingly no answer. He will find vocal expression, not only in incessant talking, but also in singing, after his own fashion, at times converting his speech into a kind of primitive song, as though the ordinary mode of expression were inadequate to the occasion. He delights in watching a grown-up person draw, and is a keen critic of lack of fidelity. He will try at a very early age to use the pencil himself, and then he draws real things—people and objects with which he is quite familiar. Moreover, he is a keen student of pictures of all kinds, using the fruits of his observation to provide a criterion for artistic criticism of an exceedingly straightforward character.

Now in doing all these things he is happy, bright of eye, unrestrained in movement and in play of thought. But let the teacher or parent forsake the simple regulation of his natural activity to begin the formal work of instruction in the so-called elementary subjects, and in a very short time the interest and brightness depart, and a strained look comes into the eyes, which ought to act as a danger signal if we Olympians had any adequate sense of the needs and limitations of childhood.

At first he may appear to be taking a keen interest in the letters of the alphabet, but it is not the kind of interest which leads quickly to the acquisition of a power of reading. The letter O is "like an egg;" capital L is "like a boy sitting down with his legs stretched out;" Q can be turned sideways and readily made into a "pig with a curly tail," and so on. He will have nothing to do with writing c-a-t while he can draw a more or less faithful picture of that animal; such a course is merely silly. And even the simplest excursions into the field of arithmetic puzzle him to no purpose.

The real facts are these: He will learn to read when he sees that by means of this power he will be able in time to add to his stock of stories or information without depending entirely upon the grown-up people, who seem to have so little time for the things that really matter. He will learn to write when he finds that he will thereby be enabled to communicate with an absent friend, or to pretend to do so, which is almost as good. And he will learn to do simple "sums" when it is quite clear that they have real connection with the interests nearest to his heart—when, for example, he has "got into" marbles.

The Logical Inference.

In all this there appears to be a guiding principle for the educationist who wishes to proceed on a natural and therefore a scientific plan. It is this. Seeing that the child, left for the most part to his own devices, occupies himself largely in making observations of men and things, and *so getting into touch with his environment*, when he begins his school life, the best part of his time should at first be spent in observation lessons of as informal a character as the necessary limitations of the teacher's work will permit. One of these limitations, which ought not to be necessary, is, of course, the size of the class. A company of eighty children taking "individual observation" of a live cat is a subject for a genius in humorous art.

If the serious work of reading, writing, and arithmetic is postponed until the child's brain has been given an opportunity to grow, many of the difficulties which worry both teacher and child in the initial stages of these subjects will not appear, and progress will be twice as rapid. To take a concrete example. In teaching reading by a phonetic method, one of the chief difficulties is to prevent the child confusing the name of a letter with the sound which it represents; and one has met with the impractical suggestion that the young child should never be allowed to call a letter by its name. If we waited a year longer before beginning the work, we could distinguish between name and sound in a way that any intelligent child could understand.

When the pupil actually begins the so-called elementary subjects in a serious manner, there will, of course, be less time for observation lessons. But throughout the ordinary primary school course these lessons, varying in character as the child grows older, ought to form the centre of the curriculum; and the effect of carefully-planned and comprehensive work of this nature will be the brightening of the intelligence to such a degree as to interact beneficially upon the progress made in the more conventional subjects. For example, the pupil whose mind is stored with useful, interesting, and connected knowledge, drawn from an extended field, will require fewer of those "notes and meanings" which help to deaden much of the interest in the reading lesson by drawing off the attention to a side issue.

To put this important matter in another light. The educator has cleared the ground and simplified his work in a material manner as soon as he sees that reading is, for the most part, only a means to an end—that of storing the mind with impressions which cannot be received at first hand. At the beginning of his school course there is no necessity for the pupil to employ this means to gather impressions, seeing that his first concern is to make himself personally acquainted with his immediate environment. When this has been accomplished in an adequate degree, he is ready to extend his horizon by means of reading, helped by his power of imagination, which has been nurtured upon the knowledge collected by immediate observation. In order to prepare for the time when the direct sense impressions cease to satisfy, we must begin the mechanical work of learning to read at a comparatively early age. But the age of four or five is too early. If we began at six or even seven, "reading in a twelvemonth" would be the rule.

The fact that we are learning to dispense with the narrow term "object lessons" is significant and helpful. There are more things in heaven and earth than mere

"objects," each of which must be of a convenient size to fit into the shelves of the school museum; and the intelligent child can be interested in most of them, provided that he is shown what connection they have with the ordinary daily life of himself or his fellows. If we observe him carefully, with the object of finding out his interests, we shall be able to fix the scope and character of that branch of school work which we are at present considering. He is interested in (1) himself; (2) his immediate surroundings in their bearings upon himself; (3) other people and their doings, especially little people; (4) living animals; (5) the most prominent natural objects and phenomena; (6) flowers and plants as living and changing things; (7) objects of art and manufacture, especially those which can be taken to pieces, and mechanical toys; (8) buildings, and particularly bridges; (9) means of locomotion; (10) construction and destruction, alteration and adaptation, weighing and measuring. Let the teacher on the look out for hints study the shop window of that excellent practical psychologist, the toy-merchant of a modern type.

Object and Observation Lessons.

These various branches of the observational work are artificial, and they overlap at many points. The child left to himself does not think in compartments, and the teacher would do well to remember this in the practical work of the school. A definite subject or central idea is, of course, necessary for each lesson; but it is a mistake to check the thought of the pupil when it leads naturally to cognate subjects for purposes of comparison and contrast. Moreover, the observation must be of a kind which brings into play not only the sense of sight, but also those of touch and hearing, and occasionally those of smell and taste. Sometimes the lesson may consist of organised observation of an object or group of objects within the classroom itself. At another time pictures or accurate models may provide the subject-matter. Another type may aim at arousing the interests of pupils in something outside the schoolroom which they have often seen, but have never observed, followed, of course, by a summing up of the reports of the observers.

Branches of the Work.

The primary object of the work is purely educational—the drawing out and bringing into play of all the faculties, and the formation of a habit of patient and accurate observation, and of application to a fixed aim. There are, however, other results of the teaching. One is a marked addition to the pupil's stock of pleasure. A normally healthy child is perfectly happy watching his surroundings, thinking and asking questions about them, using his fingers, planning, comparing, classifying, establishing similarities, detecting differences, altering and combining to suit his fancy. Further, the store of knowledge accumulated provides the material for conversation and narration, oral and written, and is the best possible antidote to the development of an abnormal egoism.* Many of the facts drawn from observation will afterwards be practically useful, both for avoidance of discomfort, or even of positive harm, as well as in the performance of the daily duty. Lastly, one very important result of the work will be to place the pupil in possession of a store of first-hand knowledge, upon which, chiefly by the exercise of his imagination, helped by pictures and verbal description, he will be able to build up a second-hand knowledge of an environment which will possibly never be his own. The child who has made careful observation of the domestic cat, and has seen a field of tall grass as well as a rifle, can readily picture to himself a tiger hunt in the jungles of India.

The Object of Observational Work.

He does this kind of thing habitually in his play. In fact, with many a child, the actual first-hand knowledge of familiar things is a secondary matter compared with the imaginary world which it helps him to create. We can make use of this characteristic to extend his knowledge of things which lie beyond his immediate horizon. The observation of the real thing ought to lead to information on things far removed from the pupil's experience, but connected in type with the object or phenomenon observed. Whether this information ought to be tacked on to the observation lesson or form the subject-matter of a separate lesson given at a later date is a matter of convenience or organisation. But the teacher who does not make use of this principle will miss a material help in his task. And this consideration ought to affect in a very real manner the choice of topics in framing a scheme of work. The practical question will be, Can this subject be used as a basis for extending the pupil's knowledge with the help of his power of imagination?

A Means to an End.

One further result of the observation work we must pause to consider a little. We are often told that our pupils leave the elementary school entirely wanting in any power of reasoning, or, to speak colloquially, of "putting two and two together." One reformer reminds us of the value of English grammar, and urges the use of this subject to supply the deficiency. Another adds a "fourth R" to the three already known to all of us, and, with an eye to alliterative effect, sums up the primary school curriculum under the headings reading, writing, reckoning, and reasoning. He suggests that the last-named subject might consist of verbal exercises framed to train the power of drawing a correct inference and detecting a fallacy—a species of elementary logic. But there is no necessity to add a new subject to the curriculum. If the work of observation is conducted in an intelligent manner, it presents numberless opportunities for the exercise and strengthening of the power of reasoning, such opportunities as no mere verbal exercises can ever supply. The normally healthy child is always asking, "Why?" And the true educator is always replying, "Now, I *wonder* why it is so. Let us try together to find out."

It is interesting to note how large a portion of the stereotyped primary school programme can be swept into this branch of work, to which we have given the name of observation lessons. It may include (1) all the ordinary object lessons; (2) all the geographical lessons of the first two years, if we include in this branch of work the observation of pictures; (3) a certain proportion of the geography lessons of the higher standards; (4) all the so-called "history" of the lower standards, which ought to consist of picture study and story-telling; (5) a great deal of the history of the upper standards—visits to museum, old castles, and other places of historic interest; (6) such lessons in citizenship as are of real value to children below the age of four-

A Comprehensive Subject.

* "A man's thoughts must be going. Whilst he is awake the working of his mind is as constant as the beating of his pulse. He can no more stop the one than the other. Hence, if our thoughts have nothing to act upon, they act upon themselves. They acquire a corrosive quality; they become in the last degree irksome and tormenting."—PALEY.

teen; (7) all the elementary "science" and nature study of the upper standards; (8) almost all the instruction in the laws of health; (9) the pupil's first lessons in arithmetic, which ought to be based upon the observation of concrete objects. If our aim is the simplification of the curriculum, there appears to be an opportunity here for grouping a large number of so-called "subjects" under one general heading.

On the important matter of graduation the organiser ought to formulate a few definite guiding principles before beginning the work of drawing up his detailed scheme. For younger pupils, who are usually taught in gangs numbering from sixty to ninety, care must be taken to select objects or phenomena which can be readily observed by all. On the whole, minute observation is not for the youngest pupils, nor are they prepared to consider cause and effect, except in its broadest manifestations. They may note the colour, shape, odour, and general appearance of a flower, but ought not to be asked to dissect it; in a lesson on the wind they may consider its effects, while the causes of the air movement should only be studied by the oldest pupils. This reminds us in passing that a subject may appear more than once in a complete scheme of school work, the point of view and method of treatment varying with the age of the pupil. For the youngest pupils, life in all its ordinary manifestations rouses most ready interest. Only at a later date does the pupil show a real interest in inanimate objects, and even then he requires to know what connection the thing observed has with human life and activity.

A complete scheme of observation lessons can only be properly drawn up after the work is done. In other words, the annual syllabus presented for approval ought to contain gaps which are to be filled according to circumstances which may arise during the ensuing twelve months. A heavy storm of wind or rain will provide material for an interesting lesson, younger pupils being expected to observe its effects, and those in higher standards to study the causes and the measures taken for protection; while the imagination can be brought into play to picture typhoons, hurricanes, monsoons, etc. A snowstorm or a severe frost can be pressed into educational service. A thunderstorm can also be used with effect, though the teacher must determine for himself whether he will give his lesson while it is in progress, or postpone it until weather conditions are less disconcerting. But in either case younger pupils should receive a few practical warnings, with perhaps a little reassurance; while with older pupils the teacher may discuss causes and effects, consider the structure of the lightning conductor, and describe Benjamin Franklin's experiment.

The actual changes of the moon should be carefully observed by all pupils, and notes compared in school. A clear, starry night will give occasion for subsequent lessons, varying in character and scope, but based always upon individual observation. The various kinds of clouds should be dealt with when good examples of each kind can be observed. Mist and fog, an eclipse of the moon or sun, or a striking sunset ought not to be neglected. The tides can be carefully observed when the school is near the sea or a tidal river, and some idea imparted to older pupils of their causes if the teacher thinks fit, though it is really almost a hopeless task, and a knowledge of the value and regularity of the tides is more to the point.

A visit to a menagerie ought to fill many a notebook, and perhaps afford the teacher an opportunity of pointing out that the interest of wild animals lies in themselves and their natural ways, and not in their performance of ridiculous "tricks" derogatory to the dignity of such noble creatues. A local event or the recurrence of an ancient custom ought to turn the pupils' minds in the direction of history. Nothing occasional that is of value should be missed, and the time-table ought not to fence in the work to the detriment of all elasticity, initiative, and free play of thought.

THINGS SEEN—AND OVERHEARD.

The Music Master—Peripatetic.

THE music master had begun life as a barber, which was nothing to his discredit; only the professional oil was very evident, and when he smiled at you there was something in his small black eyes which recalled the recommendation of that very reliable hair-wash to which you really ought to give a trial.

Nature had evidently intended him for the musical profession, for the little man was gifted with a capacious mouth, which had been further developed by continual contortional exercises. As he talked to the class before him, he walked lightly up and down the room, bending between his small, smooth white hands a piece of cane which served as a baton.

"Now, boys," he said, smiting the front desk with his cane—"now, *there's* a boy— Would you call that boy a gentleman, boys, lounging about like that?—Sit up, boy.—Now, boys, I want you—I want you, boys, to—*to look at me—at ME, boys.*"

This solemn injunction, delivered in a kind of stage whisper, was quite unnecessary. The boys always looked at the music master, being fascinated by the rapid and marvellous movements of his face, and interested in his perambulations. They looked so steadily, in fact, that, as a rule, they were too absorbed to sing when he told them.

"What I want you to do this afternoon, boys—Now, look at that boy, sitting gaping at me with his mouth wide open, boys.—There are no flies to catch to-day, boy.—What I want you to do this afternoon, boys, is to—*to open your mouths*—TO OPEN YOUR MOUTHS, BOYS!"

The speaker paused to allow this new charge to make an adequate impression, and then went on,—

"*All* the great singers, boys—remember this—ALL the great singers *open* their mouths."

The class stared in surprise at this astounding statement, and the music master, after another pause, pursued his primrose path.

"Now, look hard—*very* hard—at me, boys, and I'll show you how to do it. Now, there's a boy with *such* a vacant stare!—Wake up, boy!—Now, boys, are you all looking very hard at me? Well, then, you must open your mouths like this."

The music master opened his mouth and shut it with a decided snap three times in succession. The effect was more terrifying than instructive. Viewed from the front, the little man's small black head seemed to disappear entirely.

"It's like this, you know, boys," he resumed, to the accompaniment of a distinct sigh of relief from the class before him—"it's like this, boys; you must think these are apples, boys—apples floating in the air. Think of *apples*,

boys—*apples* floating in the air. Now, begin. Wait a moment. There's a boy— What *is* the matter, boy? Cannot you shut your mouth as well as open it? You must not keep it open, boy, else how can you sing?—All the great singers, boys, not only open their mouths, but shut them too. Open, shut! open, shut! Now try all together!"

THE ASSISTANT MASTER.

(*From an unpublished novel.*)

The class master was young, active, and energetic—a keen, spectacled man, with a face like a hatchet, an eye like an auger, and a voice like a file. His class was very large, and one wondered how he managed to control such an unwieldy body of irrepressibles, to say nothing of teaching them, and keeping himself acquainted with the working of each small mind, in order that his daily work might not become mere carpentry and joinery.

He knew all about the theory of it too, this wiry man of practice, and could spin out a speech on educational ideals which were doomed everlastingly to float in air because of the official fetters in which he was bound. And he often did it, too, when, at the meetings of the Imperial Association of Schoolmasters, he enthusiastically read a well-planned and well-written paper to a beggarly array of empty benches, and a group of six or seven comrades nearly all office-holders, gathered round the chairman's water-bottle.

THE PUPIL TEACHER—OLD STYLE.

The time was early morning—about 5.30, to be precise—the season winter. By a round table in the centre of the room sat a cloaked and hooded figure which, viewed from the back, resembled some old cowled monk poring over a missal. A front view revealed the face of a lad with downy cheeks, a determined mouth and chin, and a pair of keen gray eyes. Over his short, crisp brown hair was drawn the cape of a heavy tweed overcoat he was wearing, and, to keep the cape in its place, a woollen comforter was tied round his neck. On his left hand was a woollen glove, on his right an old leather one, with the thumb and two forefingers missing. A thick rug was laid over his knees, and wrapped tightly round his feet.

Behind his straight-backed chair was the bed from which he had risen, by no means willingly, at a quarter before five. It was no couch of luxury, or even comfort, being constructed nightly upon a sofa and four chairs; for, during the day, the room did duty as a family parlour, and suggested anything but a bedroom. The furniture in the room bore evidence of much hard wear; yet even in the extremity of its shabbiness there was a certain air of refinement about the little parlour. This was chiefly owing to the presence of a well-filled bookcase and one or two good engravings. The lad held a pen in his right hand; before him lay a small red-edged copy of the First Book of the *Æneid*. It is a mighty work, this of the Mantuovan, "wielder of the stateliest measure ever moulded by the lips of man;" an outstanding, glory-crowned peak in the long range of those creations whose line stretches back to the misty prime; a work that marks an epoch and dwarfs the memory of consuls, emperors, and leaders of the commonwealth of kings: yet the lad was chiefly and painfully concerned in his attempt to find correct English equivalents for the words and phrases of the masterpiece. Again and again he lost himself in the maze, but each time he began afresh, and battled till the long, involved sentences fell into intelligible shape, and he saw, across the centuries, the mind of the master singer, and felt the strength of victory.

By this time the watch on the centre of the table indicated the hour of seven. The student turned, with no apparent willingness, to a book of geometrical conic sections, and opened a mahogany box of mathematical instruments. With skilful fingers he quickly drew a couple of curves, with a few lines crossing them, and then set to work on the problem represented by this spider's web. For half an hour he pursued the elusive Jack-o'-lantern, marshalling all the results established by previous problems in a circle of letters and mathematical signs round his drawing, like a mimic minute army besieging a stubborn citadel. But at the end of the time the lad was no further forward, and with a gesture of impatience he rose, put away his tools, and raised the blinds to let in the gray dawn of the working day.

AN ECHO OF THE HEADMASTERS' CONFERENCE.

"The Rev. G. Rendelo (Charterhouse) expressed opposite views. He had been familiar with both forms of pronunciation, and he thought that the agitation for reform in the school teaching of Latin proceeded from academic considerations. Dr. GLW also declared himself to be adverse to the motion."—*Daily Telegraph.*

If Singor Rendelo would kindly pronounce Dr. GLW's name in any language, the other question would settle itself.—*From "Punch," with acknowledgments.*

THE PUBLIC ELEMENTARY TEACHER IN FRANCE.

BY BENJAMIN DUMVILLE, M.A.

AT a time when *l'entente cordiale* is so much in our minds; when the councillors of London and of Paris, not to mention those of smaller towns, are receiving and returning visits; when French professors parade in their robes at the Imperial Institute; and when *le Lord Maire* drives up in state to the Hôtel de Ville, English people are directing their attention to their *voisins d'outre-mer* more closely than has been the case for several decades.

Neither your cheap tripper to Paris nor your educational "expert" who spends a few hours in the French schools can give a true account of what goes on from day to day. The French are greater adepts in the art of "showing off" than the English. Even the boys of the *école primaire* will enter into the spirit of the occasion, and will behave so uncommonly well that the visitor comes away with glorious tales of the docility of the French youngster, and of the good understanding which exists between him and his teacher.

The writer has made his way into many French schools in various parts of France. He has sat in the same classroom for hour after hour, until the boys have become oblivious of his presence. He has smoked the pipe of peace with the teachers after the day's battle, and, *tout doucement*, he has sounded them as to their real thoughts and feelings on the work in which they are engaged. He therefore claims to speak with some authority, not on account of a reputation in England, but because of his long experience in France.

It is only natural that the English teacher should have a confused idea of his French *confrère*. For the

position of the latter is very different from his own. It is to give a clear conception of the present condition of the French teacher that the following article has been written.

First and foremost, the *instituteur* is a civil servant. His salary, however, is small, commencing at about £45 in the provinces, and rising painfully to a little over £100 (for assistants). Paris alone gives salaries which may be termed good.

All the government schools are secular, and no public money whatever is given to any other school.

In spite of the small salaries which the government offers, it expects much more from its teachers than is required in England. Although the teachers are supposed not to meddle with politics, there is little doubt that the government schools are, for the time being, a political weapon.

France is at the present moment divided into two camps, which may be named the Republican and the Clerical. The former party has established the secular schools, not merely to supplement the Church schools, but to supplant them, and, in so doing, to destroy one of the chief sources of the political power of the Roman Church. The struggle reached one of its crises in the question of the separation of Church and State.

The Republicans are not necessarily haters of the Church. True, a large number of them are freethinkers; but many still continue to submit themselves and their children to the principal sacraments. The Clericals are not necessarily enemies of Republican doctrines, though most of the royalists and other reactionaries, on the principle that unity is strength, have joined forces with them. It is important, therefore, to distinguish between Roman Catholicism and Clericalism. It is possible for a sound Catholic to be anti-Clerical. Clericalism denotes Church interference in politics. The Republican does not attack the Clerical as a Catholic. He merely objects to the overweening influence which the Church has obtained in public affairs, and his opposition is fierce because he feels that the very existence of the Republic is in danger.

There is no doubt that the rich and the nobility are, for the most part, Clericals. Many, as has already been hinted, have joined the "party" for political rather than religious reasons.

A still more serious cause of apprehension for the Republican is the fact that a large number of the officers in the army are on the side of the Clericals. Unhappily, Combes and his followers resorted to underhand measures to guard their party against this danger. The order of the Freemasons in France has become little more than a political association in the service of the Republicans. The discovery of the *fiches*—secret reports on the opinions and private conduct of officers, with a view to avoid the promotion of those who are unfriendly to the government—led to the downfall of the Combes ministry; and, though the party has continued the work, this affair has done considerable harm to the cause.

The French recognise, perhaps more than the English, the immense influence which the schools have in moulding the opinions of the new generation. The Republicans consider their schools as the nurseries of the Republic of to-morrow, and they depend on their teachers to preach the principles of liberty, not by speaking against the Church, or even against Clericalism, but by endeavouring to form minds capable of considering questions on all sides, and of trying to arrive at impartial decisions. So far are they from opposing the legitimate exercise of Church influence that in most of their schools children are frequently allowed to leave a few minutes before the proper time, in order to be punctual at catechism.

They are, however, dogmatic on one point; and it is necessary to emphasise this, even at the risk of repetition, because it forms the chief justification of their action against the Church schools. They hold, as their first principle, that children should be educated without instilling prejudices into their minds. Nothing which is susceptible of examination should be accepted as true on trust. To form citizens capable of exercising with discretion the right of voting and of governing themselves—this, they say, is the only safe method. It is, in short, the pledge of the existence and progress of the Republic.

The war against Roman Catholic schools, then, is waged, not because a specific religion is taught therein, but because the minds of the pupils are moulded according to certain definite convictions, political and philosophical, as well as religious, without any attempt being made to give them the ability or opportunity to think for themselves. Part of this teaching, it is maintained, includes the more or less surreptitious nurture of a blind hatred of Republicans and their principles.

The schools of the *frères* have been "closed" because these teachers were considered unfit to train citizens for a *régime* of liberty. It was pointed out that the *frères* had sworn unquestioning obedience in everything to their superiors. The latter were often not only absent from France, but of foreign extraction. They had, therefore, no right to meddle with the destinies of France, and their hold on a portion of the French youth was the partial domination of a foreign authority.

The supporters of the *frères* naturally appealed to the principle of liberty. Their schools were maintained entirely at the expense of the Church, and were, moreover, under a measure of supervision, government inspectors having the right to enter them (though not to question the pupils). It certainly does appear somewhat paradoxical that a large section of the party whose chief demand is for greater liberty should be anxious to obtain it by what seems to be the sacrifice of the liberty of others.

To this objection two answers have been given. First, liberty itself must never be understood as absolute. The highest liberty to which man should aspire is freedom to act according to the dictates of reason. The lower and smaller sphere must be subordinated to the greater. Just as the State, even under a *régime* of freedom, should prevent parents from deforming the bodies of their children, so it is equally its duty to see that the minds of the young generation are not warped by training them to accept certain opinions without judgment, and by nourishing them in hatred of all who are not of the same convictions. They may be brought up in the practice of any religion which their parents wish them to adopt, but they must be trained to examine and judge all that is capable of such treatment. (Some might argue that these two principles are incompatible.)

The second answer is that the special circumstances demand a temporary restriction of liberty. The Republicans, although possessing a majority, find that the measures they take are rendered abortive by the Clericals, who have the rich on their side. The schools

which were condemned continue practically as before, the only real change being a re-shuffling of the teachers, with a change of dress.* The government party, then, find it almost impossible to make the changes which their numerical superiority should permit, and the abrogation of the principle of liberty for a period, in favour of government monopoly in education, is considered by some as a kind of mild *coup d'état*, which is necessary in order to break the disproportionate influence of the Clerical party.

Up to the present the government has looked to its teachers to outrival the Church schools by the excellence of their work, and by organising a number of extra-scholastic and post-scholastic institutions, such as savings banks, country holiday funds, mutual aid societies, school dinners, school excursions, supervision of children out of school hours, old boys' associations, evening classes, and public lectures, one of the objects being to counteract the influence which the Church and its schools obtain by similar means.

To encourage the teachers in these extraneous duties, the rewards offered are very small. The following are extracts from recent government regulations :—

"In 1905, special prizes will be awarded to the teachers who have given their services in the teaching of adults with the most zeal and success, and who have distinguished themselves by co-operating in the complementary work of the school.

"These prizes consist of medals accompanied by sums varying from 100 to 50 francs, and in presents of books.....

"The number of these medals and prizes is fixed as follows:—100 medals of silver-gilt, with bonus of 100 francs; 150 medals of silver, with bonus of 75 francs; 400 medals of bronze, with bonus of 50 francs. [This for all France!]

"For the present year, an extra holiday of one or two weeks at the most can be granted to the teachers who have conducted evening classes or popular lectures, or who have actively co-operated in the complementary work of the school.

"This extra holiday will immediately precede the summer holidays, or will be added in portions to the various holidays which are given during the school year.

"It will be granted by the prefect.....on the proposition of the chief inspector."

Another way of inciting the teachers to labour is found in the famous *décorations*. All those who have been to France have noticed the little ribbons in the button-holes. They have nothing to do with abstinence from strong drink, as with us. They indicate that the possessor is *officier d'académie*, or something of the kind. Although derided by those who have them not, they seem to be prized by those who have secured them, whether by solid work or by patronage. And if these distinctions can be made to replace the more tangible pounds, shillings, and pence, which the practical Englishman prefers, they are not to be despised. Like all things of the kind, however, they have their limits, and the reproach with respect to them is at present similar to that with regard to the number of colonels and generals in America.

Several gentlemen with high positions (and big salaries) are never tired of telling the elementary teacher what he can do for France, if he will only sacrifice the whole of his energy and time to the work. Long addresses and big books* have been composed on this noble theme.

In spite, however, of all these ingenious devices, it is found that *faire bonne chère avec peu d'argent* is a somewhat difficult task. And it is the despair of ever beating the Church on the present terms that has led many to demand a government monopoly in education.

Meanwhile the teachers, who have worked so hard in the Republican cause, are crying out for some recognition of their efforts. They feel that they have been to some extent hoodwinked. They no longer rouse themselves at the rallying cries of those who would save France *à bon marché*. "*Pas d'argent, pas de suisse*" tends to become their motto, and we find even the well-treated teachers of Paris beginning to complain of such duties as the supervision of children's dinners. The following quotation, though taken from an appeal for better treatment of teachers in training colleges, admirably expresses the general sentiment :—

"In the interests even of secular instruction, and in the highest interests of the country, which is making an admirable struggle for intellectual freedom, and which has need more than ever of devoted teachers, we ask for remuneration in proportion to the services which we render, and to the importance of our function in the work of public education."

The Practical Teacher

Among the useful and interesting features which the Editor hopes to include in next month's issue are the following :—

Some Oxford Educators. An article of special interest to all members of the N.U.T., particularly those who hope to attend Conference.

Educational Experiment. An entirely new monthly feature, containing accounts of interesting experiments in method and organisation, as well as suggestions for further experiment; including a paper on "Conan Doyle as History Teacher."

Relief Maps in Teaching Geography. By Dr. James Knight of Glasgow. Practical hints for teachers of this subject. Fully illustrated.

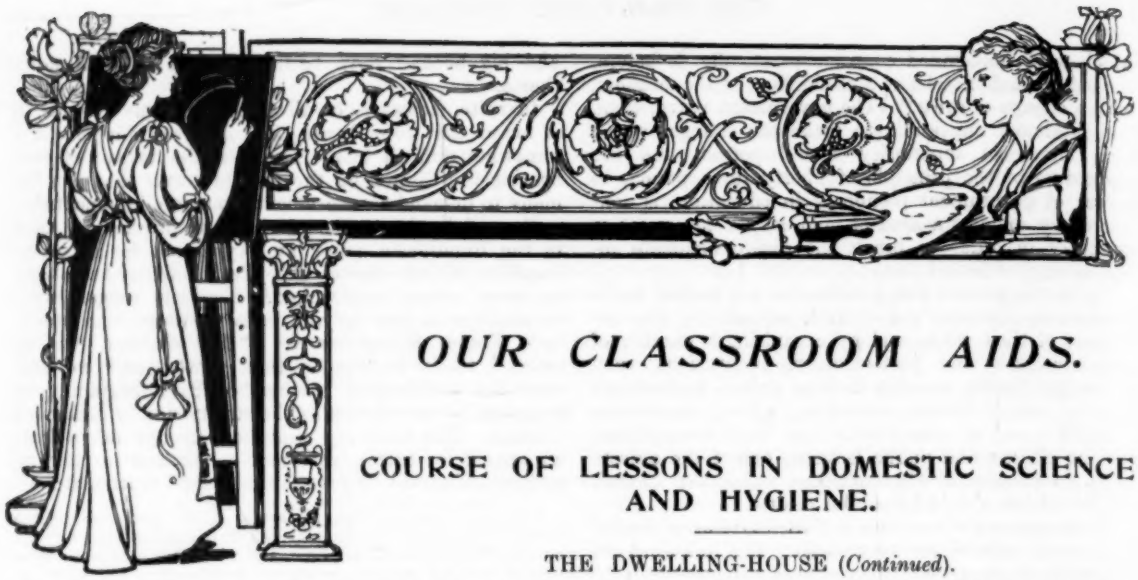
Special Offer for March.

A PRIZE OF ONE GUINEA is offered for the best Outline Reading Scheme for the Elementary School, designed to introduce the pupil to real literature. Contributions, with Coupon from cover, should reach the Editor on or before February 1, 1907, and should be endorsed "English Prize Scheme." The Publishers reserve the right to print any of the schemes sent in.

INTERNATIONAL CORRESPONDENCE.—If any of our readers are studying Italian, and would like Italian correspondents, they can be put into communication with suitable correspondents on sending their names and addresses to this office.

* The law forbade schools conducted by *frères*. The *frères* then—nominally, at any rate—renounced their vows, removed their cassocks, changed schools with one another, and thereby satisfied the letter of the law. But the "new" schools thus started were in reality the old ones under a disguise. The following extract from the speech of a chief inspector bears out this statement: "Speaking of the law with respect to the *congrégations enseignantes*, M. Bianconi remarks that if there have been schools closed, new ones have been opened: the teaching staff has done nothing but change its costume, but the spirit of the teaching has remained the same. The struggle, says the inspector, has not come to an end; and if the pupils of the secular schools have increased in numbers, this progress will only continue thanks to the devotion and to the zeal of the *instituteurs* and of the *institutrices*."

* Vide, *L'Ecole de Demain*, by M. Edouard Petit.



OUR CLASSROOM AIDS.

COURSE OF LESSONS IN DOMESTIC SCIENCE AND HYGIENE.

THE DWELLING-HOUSE (*Continued*).

Step III. Association.—Being acquainted with the various materials used in the erection of a house, the next step is to consider how these materials shall best be utilised, and what precautions must be taken in order to secure a healthy dwelling.

1. *The Selection of a Site.*—The situation and aspect of a house have such important bearings on its general healthiness that it is most essential that a good site should be secured. An ideal site should allow an abundant supply of air; it should be warm in winter and cool in summer; there should be a good supply of pure water; and suitable arrangements should be made for the removal of excreta, slops, etc. It is not always easy, especially in large towns, where the high value of land tempts owners to build houses in close proximity to one another, to find a house that meets our requirements on the first point; but houses should always be avoided which are built back to back without a good space between for the air to circulate; the windows, too, should be large and numerous. In order to secure the second point, the aspect of the house must be considered; if possible it should face toward the south or south-west, as this secures the greatest amount of sunshine, and, at the same time, escapes the bitter north-east wind; a house facing north or north-east is always bleak and cold. This should also be borne in mind in the internal arrangement of the house; rooms requiring coolness, such as larders, store-rooms, etc., or those that are only occasionally used, such as sculleries, workshops, etc., should be chosen from those facing north, leaving those on the sunny side for bedrooms and living rooms. The question of water supply does not affect the town dweller, who is entirely at the mercy of a water company; but before taking a house in the country it is most important to ascertain that the water supply is constant, and not liable to contamination (see lesson on Water).

2. *The Character of the Ground.*—However favourable a site may be in other respects, it should not be chosen unless the soil is of a suitable nature. For our purpose we may divide the soil into three classes: (1) Solid masses of hard rock, such as granite, limestone, chalk, etc.; (2) sand and gravel, consisting of portions of the former beds broken into fine pieces by the various agents of denudation; (3) clay, which is a stiff paste formed by the decomposition of felspar and other minerals. Specimens of these three classes should be shown, that the scholars may see how each is affected by water; for by pouring water on each it will be seen that the sand is permeable, while the granite and the clay are impermeable. But although water runs off both these, it leaves the clay very wet and sticky. Hence we find that masses of hard rock form dry, healthy sites for houses, as the rain-water drains off readily, leaving little moisture behind; but, on the other hand, this has its drawbacks, as it increases the difficulty of obtaining water for household purposes. Clay, as a rule, makes a very unhealthy site unless it has been artificially drained, for otherwise moisture does not run off readily, but keeps the house continually damp, and also collects organic impurities. Gravel is perhaps the best soil of all, as it allows the rain to sink in, and, at the same time, filters it more or less, thus providing a supply of clear water. There is one variety of soil that should be carefully avoided—that is, "made soil." Dwellers in towns are only too familiar with the notice on pieces of waste land, "Rubbish may be shot here," which means that the owner of the land wishes to fill up the inequalities on his land, and is willing to accept any rubbish and refuse for that purpose. Many years are required to elapse before made soil is fit to build upon, as the putrefaction of the organic matter renders the air impure, while the gradual subsidence of the material is a source of danger to any house built on it.

An examination of the old maps of any town will show that early builders attached great importance to the selection of suitable ground for their building operations, for the growth of most towns has been largely determined by the nature of the soil; thus, in the case of London, it will be found that as the city grew it followed the beds of gravel that form the larger area of the drift of the Thames, and it is only within quite recent years that builders have erected houses on the London clay and brick-earth.

3. *The Foundation.*—The parable of the house built on the rock and the one built on the sand will serve to remind the children of the necessity of a solid and substantial foundation, for unless this is provided the ground will probably sink, causing the walls to crack, and rendering the house unsafe. In making the foundations the

ground should be excavated until a bed is reached which is not likely to sink, and this should be laid with a bed of concrete at least one foot thick. When dry, this forms a solid bed for the house to rest on; it also serves to keep out the ground air, which is otherwise drawn into the house, and it prevents moisture rising from the ground.

4. *The Walls.*—These, of course, require to be well built with good materials, such as we have already considered; but there are certain precautions which must be taken to protect them from damp. Stand a piece of sugar in a saucer of coloured water and the liquid will be seen to rise in it; if a second piece is placed on top of the first it will rise into that as well, and even into a third or fourth piece. This illustrates the manner in which water will rise in the walls of a house, unless an impervious layer or *damp-proof course* is provided. This should be placed a foot or two above the ground, and may be formed by (1) a couple of layers of roofing slates; (2) a layer of asphalt; (3) a layer of glazed stoneware slabs. Care must also be taken that all parts of the building that are likely to throw off water, such as window-sills, cornices, etc., should project beyond the walls, in order to throw the water clear of them.

5. *The Covering for the Walls.*—Bare walls are both unsightly and, being absorbent, unhealthy; so it is necessary that they should be covered with something that will overcome these defects. Cement and glazed bricks are extensively used in hospitals and public buildings, as they are practically non-absorbent; but they are too cheerless for the walls of an ordinary dwelling, the best covering for which is undoubtedly paint. Paint is made, as a rule, by thinning white lead (carbonate of lead) with turpentine and boiled oil, and tinting it with various pigments. White lead is poisonous; there is, however, no danger from its use after the paint is dry, but during the process of drying fine particles of white lead are carried into the atmosphere with the turpentine, for which reason newly-painted rooms should not be used until the paint is dry and the rooms thoroughly aired, otherwise these particles of lead will cause headache or even colic if breathed for any length of time.

Paper is the material most commonly used for covering walls, as it is less expensive than paint; but, being absorbent, it is less healthy, as it becomes loaded with dust and germs, for which reason a new paper should never be laid over an old one. On account of its absorbent properties paper should not be used to cover the walls of bathrooms, domestic offices, etc., unless it is well varnished. At one time compounds of arsenic were largely used in the preparation of colours for wallpaper printing; this was particularly the case with certain shades of green—Scheele's green being almost pure arsenite of copper—but it has also been found in other colours, such as blue, mauve, and red, while some white papers are heavily loaded with it. The danger in connection with the use of these colours lies in the fact that they are made to adhere to the paper by means of size, but when this gets thoroughly dry it loses its adhesive property, and allows the particles of deadly poison to float off in the air. In most countries on the Continent the sale of arsenical papers is prohibited by law, but until such a law is passed in this country it is advisable in purchasing wallpaper to buy it of a firm of repute, and to obtain a guarantee that it is free from arsenic; or, better still, to have a sample tested, as may easily be done by any one possessing a slight knowledge of chemistry. Reinsch's or Marsh's test readily detects the presence of arsenic.

6. *Floors.*—Except in the basement, wood is the best material for floors, stone or tiles being too cold to the feet. The boards should be carefully laid, so as to leave no cracks or spaces through which dust and dirt can drop on to the ceiling below, where it may possibly decompose and vitiate the atmosphere. For this reason hard wood floors are better than those made of cheap coniferous timber, which generally shrinks, leaving gaps between the boards. A hard wood floor, too, can be polished, which renders it almost non-absorptive; then it can easily be kept clean by wiping over with a damp cloth, and, having a pleasing appearance to the eye, it does not require much covering. When carpet is used to cover the floor it should not be made to fit the room, as the difficulties of removal in such a case are so great that it is only taken up at long intervals; thus it becomes choked with dirt, consisting of dried mud, animal and vegetable refuse, etc., which is a positive danger to health. A small square in the centre, which can be easily removed and cleaned, is all that should be used; while in bedrooms it is not advisable to use carpets at all, matting being much more healthy. Oilcloth and linoleum are easily kept clean, but they should be taken up occasionally to air the boards beneath, otherwise they promote dry-rot.

Step IV. Formulation.

1. Materials used for building purposes—
   - (*a*) *Bricks:* baked clay—hard, durable, but absorbent.
   - (*b*) *Mortar:* three parts sand to one part slaked lime.
   - (*c*) *Stone:* expensive, and not so durable as brick.
   - (*d*) *Slate:* an altered form of shale.
   - (*e*) *Tiles:* baked clay.
   - (*f*) *Concrete:* a mixture of cement and gravel—easily worked, durable, resists moisture.
   - (*g*) *Plaster:* the finest is burnt gypsum or plaster of Paris.
   - (*h*) *Timber:* soft wood—as pine, fir, etc.; or hard wood—as oak, ash, beech, etc.
2. The precautions to be taken in building—
   - (*a*) *The site* should have sunny aspect, well-drained soil, good supply of water, and no obstructions to the air.
   - (*b*) *The foundation.* A foot of concrete should be laid to keep out moisture and ground air.
   - (*c*) *The walls* require a damp-proof course. The interior walls should be of glazed brick or plastered and painted. If papered, test for arsenic.
   - (*d*) *The floors* should be of polished wood; the less carpet that is laid the better; linoleum should be taken up periodically.

Step V. Application.—It may be contended that among the lower and middle classes the selection of a dwelling is made from other considerations than the laws of health, such as proximity to work, low rent, etc., and it is therefore useless to discuss the ideal house; but although this is frequently the case, it only shows the necessity of bringing this point before the rising generation, in order that they may realise that an insanitary house cannot offer any advantages which can possibly compensate for loss of health.

NOTES FOR LESSONS ON CROCUS CORMS.

BY J. BENTLEY PHILIP, M.A.

FEW specimens provide a better subject for study than crocus corms. They will keep a whole class busy for six weeks (at the rate of two lessons a week), or even for two months, and that without going over the same ground twice.

The Shape of the Corm.—An india-rubber ball, about an inch in diameter, if compressed between the thumb and a finger, represents fairly accurately the size and shape of a corm at the end of the season's growth. Pupils will readily make other comparisons, especially after the removal of the brown covers which somewhat obscure the outline.

The Brown Tunics.—We begin our examination by taking off the outermost and largest of these *tunics*. It is attached along a wavy and approximately circular line running round the corm, not far from the depression at its lower end. From this line the tunic follows the body of the corm upwards, clinging rather loosely, and bringing together its ragged margin round the two or three light-coloured shoots, which, arising in a cluster from the hollow at the top, resemble nothing so much as a collection of small tusks. Alongside of the shoots, with their clean-cut outline, firm setting, and compact structure, the tunic looks insignificant enough. It is so easily detached from the corm, so easily torn along the parallel lines that mark its surface, and so withered-looking, that one is not impressed with its importance as an integral part of the corm. Before endeavouring to find any evidence of the real nature of the tunic, or any justification for its existence, we may take off the remaining tunics, which are fixed along lines higher up the corm than the first. The points in which all the tunics agree and differ may be enumerated; and, of course, one of the most obvious resemblances is the presence of the parallel lines that run from the base to the upper edge of each tunic.

The Homology of the Tunics.—Here occurs an excellent opportunity to exercise the reasoning powers of the pupils. There will not be much difficulty in getting them to call the parallel lines *veins*, and thence to infer that the tunics are leaves. More proof is required, however, and is soon found in the flatness of the tunics, and in their tendency to fade and fall off. One fact more. Just above the line of attachment of one of the tunics may possibly be found a shoot much smaller than those at the top. The shoot being nothing but a bud, we have no difficulty in identifying the tunic as the leaf in whose axil the bud arises.

Leaves, no doubt, they are, but, of course, dead leaves, and of little further import in the life of the plant. As long as they remain where they are they help to protect what is underneath from mechanical injury, and are possibly of other service as well. If this is their use when they are dead, one naturally wonders what use they were when alive, and what they were like then. Both these questions will be cleared up as we proceed with the examination of the corm, now denuded of its tunics.

The Corm without its Tunics.—The light-coloured object now laid bare is very firm and smooth. The surface, however, is freely, though not deeply, pitted, and has numerous brown, wart-like marks dotted over it. By scraping it a delicate skin may be detached.

Homology of the Body of the Corm.—Pupils that have recognised the leaf type under the disguise of the brown tunics ought to have little difficulty in proving the body of the corm to be a modified stem. Its appearance certainly is at variance with our ordinary conception of a stem; but as it bears both leaves and buds, it cannot well be anything else.

CROCUS CORMS.
(Photograph from Nature by J. B. Philip.)

Its Function.—In search of some reason for its peculiar shape we make a longitudinal section, and find that internally it consists almost entirely of a white material, apparently homogeneous. This is slightly spongy, but is firm enough to cut well, and, if the corm is fairly dry, can be scraped off as a white powder. The application of the iodine test at once proves the white substance to be starch, which we readily infer to be a reserve store. The particular part of the plant in which the store is accumulated is in need, not of length or suppleness, nor even of strength, as the ordinary tree stem is, but of capacity; and for accommodating as much material as possible within easy reach, no better shape could be found than the sphere, to which the body of the corm has approximated as nearly as circumstances permitted.

But the corm is not so very unlike a stem after all. Does it not support leaves, shoots, and ultimately flowers? More than that, it acts to a certain extent as a conducting medium. Yellow markings of a streaky nature, which may be seen on the white ground of the section, are really bundles of vessels running to the bases of the shoots. An examination of the details of

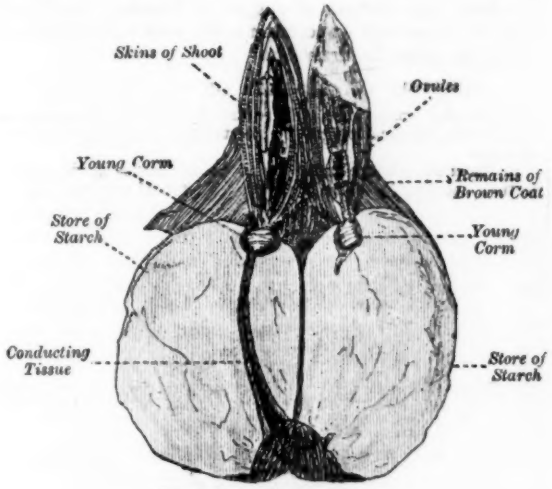
the structure of the body of the corm emphasises the fact that form is an expression as well as a result of function.

The Shoots.

Position and Shape.—The shoots at the top of the corm, as can be well seen in a vertical section, are neatly and firmly fixed in small pits in the upper depression, and some care has to be taken if they are to be removed intact. Before beginning to examine the shoots, pupils may be led to form some conjectures as to what is inside them. As everybody knows, the crocus corm produces flowers. Are the flowers in the shoots now? Is it possible to tell how many flowers would have been produced if the corm had been planted? Where will the new corms come from? With questions like these in view we may turn to one of the shoots for information.

The shoot is lanceolate in vertical outline, and tapers from below the middle to the two ends, of which the lower is the broader.

The Coats.—The outer portion, which is light-coloured, smooth, hairless, and marked with parallel veins, can

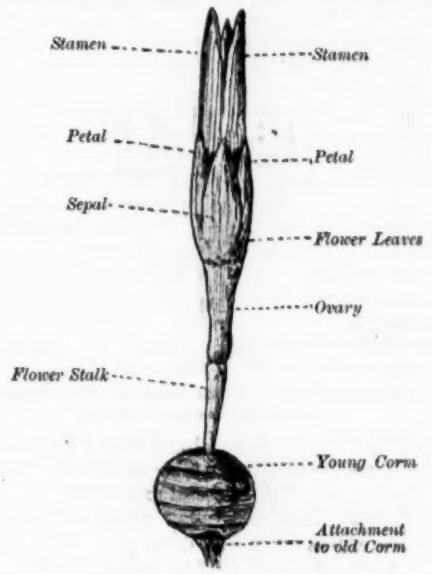


Section of Crocus Corm.
(Photograph from class drawing.)

be peeled off, and is seen to form a coat enveloping the greater part of the shoot. Its point of attachment is at the lower end. Another coat of a similar nature comes below the first, a third below the second, and so on. As coat after coat is peeled off, one's surprise grows at the complete and manifold protection which the outer portions of the shoot afford the inner. Taking off the coats *seriatim*, and writing a short description of each as it is removed, forms an excellent class exercise in observation and description. After all have been described, the points of resemblance and difference may be summarised in a sentence or two.

Homology of the Coats.—After such an exercise, pupils will have as little difficulty in assigning the coats to the leaf type as in perceiving that their function is a protective one, which they perform in a very efficient manner. Individually, the coats are not strong; but they fit so closely, one on the top of the other, that, as a whole, they constitute a substantial wall of defence for the important organs which they shelter.

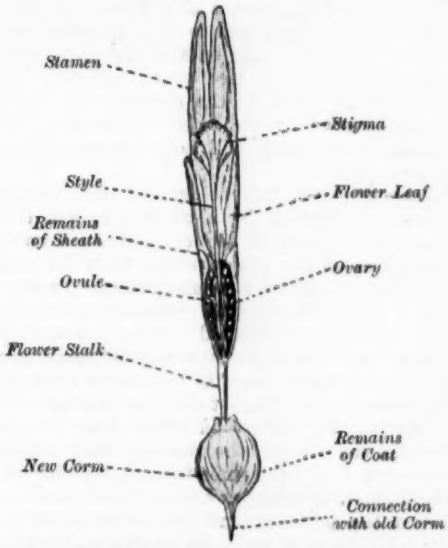
The Shoot without its Coats.—When all the coats have been taken off down to the very base, we see much more clearly the shape of the small globular body to which they were attached. From its upper end, and within the cone of coats, rises a clump of three or more



Flower without its Sheath.
(Photograph from class drawing.)

club-shaped objects, with yellow contents showing through the delicate sheath, that looks like a wrapping of tissue-paper round each. Encircling these is a ring of small, pale-yellow, strap-shaped organs, which complete the tale of the shoot's parts.

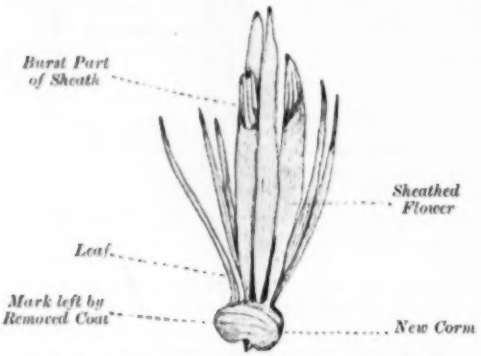
The New Corm.—If pupils are asked if they have anything to say about the small body to which all the other parts of the shoot are fixed, it will be remark-



Section of Crocus Flower taken from Shoot.
(Photograph from class drawing.)

able if some of them do not at once pronounce it to be a young corm. Perhaps they may quite spontaneously rush to that conclusion. If they do, a single question

will bring them to the further discovery that the coats, now white and soft, are destined to turn into the brown tunics that in their withered age will remain the faithful protectors of the firm old corm, whose tender youth



SHOOT OF CROCUS CORM SHOWING NEW CORM.
(*Photograph from class drawing.*)

they guard so well. Even already the white coats have got the extra glossiness on their inner side which they retain to the end of their useful existence.

The Leaves.—The pale yellow organs rising from the top of the young corm and lying next to the coats we may at once accept as leaves, owing to their likeness to these organs of the crocus as we know them at a later stage, when exposure to light has made them green and a period of vigorous growth has made them long.

The Flowers.—Last, but not least in size or importance, come the club-shaped organs. Under their sheath is the flower, which we readily identify, though it may require a little consideration to classify its parts. The upper part, of a bright orange colour, attracts attention first, and may rashly be called the perianth; but we are driven to a different opinion by the discovery of a double circle of flat organs of a lighter colour. These are placed lower down and to the outside of everything else (three of them being outside the other three), and are shaped like an inverted heart, and most delicately veined. These must be the *flower-leaves*. At present they are dwarfed by the larger organs they surround, which, however, they will soon overreach and ultimately envelop.

Perhaps the best way to get the remaining parts of the flower recognised by a class is to ask the pupils to make a longitudinal section. Above a constriction which marks off the flower proper from its stalk there will be seen a slightly swollen portion. In the section of this a row of very small rounded objects will, after a little looking, be detected. The class will probably call them *seeds*. A digression may be made to explain that, at the present stage in the flower's development, it is impossible for them to be so, and that they are only *ovules*. The cavity in which they lie must, of course, be the *ovary;* the rod-like body arising from it is the *style;* and the three-fringed, fan-shaped organs which spread from its upper end are the *stigmas*. Having identified the perianth and the pistil in all its parts (ovary, style, and stigma), we readily surmise that the three larger orange-coloured bodies, in spite of their disproportionate size, are *stamens*, and a closer examination will confirm us in our conjecture.

The Purpose of the Corm.—It will thus be seen that before crocus corms are planted they contain everything that will afterwards come out of them. Their state of preparedness for the future is indeed remarkable. The flower is already complete in all its parts. The stigmas are fully formed, and need only to grow bigger; the style has only to lengthen; and in the ovary the ovules are already arranged in neatly-set rows. The pollen is even now in the making in the bright yellow heads of the stamens, which at present are quite out of proportion to the inconspicuous flower leaves, which by-and-by will hide them in the brilliance of their floral vase. The whole thing is like a machine ready to be set in motion. Every part is in its place. Even the fuel is on the premises in full store. Nothing remains but to set a-going the flameless fire. This will, in due course, be brought about by the genial influences of spring, when fullness of preparation will find fruition in the birth of young crocuses in the depth of a flower-cup of dazzling yellow, of royal purple, or of stainless white.

Method of Study.—Stimulated by questions, pupils will be able to supply all the description and all the reasoning outlined in the foregoing notes. Oral work may alternate with written exercises, as is shown in the following synopsis of suggested lessons. There will also be abundant opportunity for rapid sketches and for more elaborate drawings.

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CROCUS IN BLOOM.
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3. Shoots. The pupils to take off coat after coat, and to write down the facts as they go along. As they have been

assisted in their examination of the body of the corm, they may now be left entirely to themselves, and plenty of time should be allowed.

4. Omissions and mistakes of last lesson. To make quite sure that all the details, especially those of the flower, have been seen, several pupils may draw to a large scale on the blackboard a single flower without its sheath. The rest of the class, with specimens in their hand, will be able to criticise. The stamens and perianth leaves may then be identified, with reasons. Some at first sight will not unlikely take stamens for flower leaves. They may be asked to prove their statement, and others to prove the opposite.

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7. Written questions following up last lessons, but new, and requiring reflection, such as—Give reasons for believing that the body of the corm is really a stem. How does it differ from stems of more typical form (tree stems)? Show how its modifications are related to its functions. In what respect do the coats of the shoot resemble the tunics of the old corm? What conclusion do you draw from these resemblances?

8. Questions by pupils, either orally or in writing, about the crocus corm?

9 and 10. Two lessons (in all 1½ or 2 hours) may be allowed for a careful drawing on an enlarged scale of a section through the body of the corm and one of the shoots. Parts should be named.

11 and 12. Careful and detailed written description of crocus corm by each pupil. Questions of homology and function should be discussed. Two lessons might be allowed for this.

Having mastered the details of the structure of the corm, the pupils will be in a position to follow with intelligent interest the various stages through which it passes in the course of growth—the bursting of the shoot, the opening of the flower, the later development of the foliage leaves. These subjects may be taken up at intervals in occasional lessons.

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PREPARATION.—Buttonhole worked on A.L. Sewing Illustrator, squares of single thread canvas, and suitable cotton or wool, and needles.

Conversation.—Elicit the different methods of fastening garments. Compare two girls, one with pinafore neatly fastened, and the other having apron pinned. Draw attention to the worked buttonhole, and educe the reason for the twist at the edge. Show how to measure the button for the hole.

Information.—Buttonholes are worked on double material, such as bands, hems, etc. When one is needed on single material, a square or oblong of calico or tape may be neatly hemmed on the wrong side for additional strength. Canvas is used only for teaching purposes. The stitch is worked on *single* material for the same reason.

Demonstration.—Make an imaginary hole on the Illustrator, either by a pencilled line or coloured tacking thread.

Fasten the cotton in by making a few darning stitches or back stitches on the wrong side.

Put the needle in at the back of the lower left-hand corner of the simulated slit.

Drawing the lower edge of the Illustrator towards you, that it may assume the position of the work in the hand, point the needle straight towards the chest.

Take hold of the double cotton which comes from the eye of the needle, and pass it under the needle from left to right.

Draw the needle out; take hold of the cotton near the hole, and pull it away from you in a straight line from the stitch, to allow the twist to fall into place.

Work as many stitches as are required for one side of the hole.

Let the class work the same number of stitches on their canvas squares.

Inspection of Method.—Remain in front of the class to see that all draw the cotton out straight to make the stitches upright.

Examination of Work.—After time has been given for a majority to get the work done, pass round the class quickly, making such comments on the stitches as "too loose," "too tight," "not upright."

Continued Demonstration.—Show on the Illustrator how these defects are to be avoided.

Draw attention to the round end.

The girls will tell you that there are no twists or knots on the stitches.

Show how to work the end by making a semicircle, composed of three stitches on each side and three in the middle.

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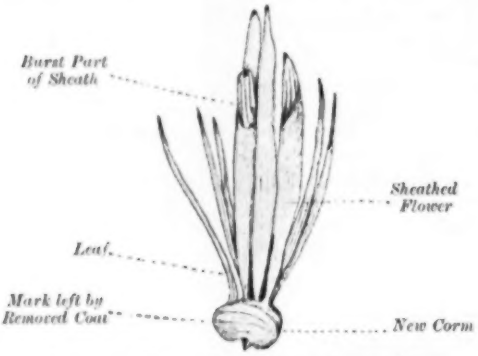

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Cutting the Hole.—Buttonhole scissors are generally used. When a pair is not available, it has been found

to be a good plan to cut the slit with a sharp penknife, the calico being held tightly over a coin or something equally hard. The hole must be the diameter of the button which it is intended to enclose.

Some people run a thread round the hole to strengthen it, but that is not necessary except on coarse, thick material. When the buttonhole is finished, the edges should meet and be quite firm.

If the cotton be pulled too tightly, the calico is drawn in, and the lips of the hole will not meet when the work is finished. On the other hand, unless the cotton is drawn firmly up, the twist is loose and does not answer its end, which is to make the edges strong.

The cotton for working should be long enough to complete the hole without a join. The stitches are kept regular and upright, and just enough apart to allow of the knot at the top of the stitch to fall into place.

Buttonholes are always placed on the left side of a man's shirt, and of men's things generally. They are placed on the right side of a woman's nightdress in the middle of a box-pleat, opposite the buttons which they should fit.

When they are needed longitudinally down the front of a garment both ends are made alike. They may be round or square.

When placed horizontally across the front, one end may be round and one square, the former, which has to slip round the button, being made nearest the open edge of the band.

After the girls have worked the buttonhole, ask them to compare their own work with the specimen in front of them, that they may be ready to point out their own defects as the teacher passes round. Attention should be drawn on the Illustrator to their mistakes, and, where possible, the cause indicated and the remedy shown.

Gussets.

Triangular gussets are placed at the openings in the sides of shirts and at the bottom of shirt sleeves.

They may be inserted into a join made either by seaming selvedges together, or by a seam and fell.

Preparation.—Strips of calico, needles, cotton, and scissors.

Method of Working.—(1.) Join two strips of calico by a seam and fell, leaving two inches unfastened for the insertion of the gusset.

(2.) Make a snip in the *fell* on the wrong side.

(3.) Fix and tack narrow hems on each side, graduating to nothing at the corner. This represents an opening in a shirt sleeve.

(4.) Take a square of calico 1½ inches.

(5.) Cut it across the middle from corner to corner to form two triangles.

(6.) Make a crease down the triangle from apex to base.

(7.) Lay a single fold all round.

(8.) Snip off the corners, and mark the figure A B C, placing A at the left-hand corner, B at the apex, and C at the right-hand corner.

(9.) Turn B over and make a fold.

(10.) Fold A and C over to touch each end of the fold. Snip off the corners.

The gusset has now assumed the shape it will have when completed, and is ready for setting.

Place the apex of the gusset to the apex of the triangle in the shirt sleeve on the right side.

Tack it carefully into place (making the corners meet exactly) up to the crease.

Seam neatly.

Turn the work over to the wrong side.

Tack the gusset down so that it lies quite flat.

Hem round the fixed side.

Backstitch across the double fold from one end of the opening to the other, on the right side.

False Hems.

A false hem is the addition of a strip of material to the edge of a garment to give the effect of a real hem.

It answers two purposes, the first being to afford support to the edge to which it is attached. That is especially needed where the side to be hemmed is on the cross, either partly or completely, as on the bottom of chemise sleeves, round the openings of drawers and combinations, and down the shaped fronts of bodices. The added strips fit better if also cut on the cross or bias.

The second purpose served by a false hem is to form a hem where the original material is too short to turn up on the bottoms of such articles as pinafores, skirts, and aprons. When the garment to which it is attached is straight, the false hem will also be straight, the width being regulated by the purpose which it is to serve.

Method of Working.—Hold the material the wrong side facing you. Place the strip at the back, with the right side facing the right side of the garment, keeping both raw edges level.

Place the work over the first finger close to the root of the nail, holding it firm with the thumb and second finger as in hemming.

Run, or run and backstitch, the two together.

Care must be taken to allow the false piece to lie easily and naturally. If it be eased, or slightly fulled, the hem will be frilled; if stretched or dragged, the hem will not lie flat.

Turn the false piece over to the wrong side.

Be sure the join comes quite to the edge, where it will not be seen.

Make a narrow turn on the free edge of the false hem.

Tack it on to the garment, and complete by hemming.

Sometimes the work is finished off by two rows of feather-stitching on the right side, one coming to the edge of the garment and the other close to the hemming stitches.

When false hems are needed for curves or sloping edges, they must be cut on the bias or cross.

To cut Strips on the Bias or Cross.—Double a square of material diagonally (from corner to corner), and press it to form a crease by which it may be cut straight. Lengths any width can then be cut parallel with that line.

To join Cross Strips.—Cut the lengths the required width. Place the acute angle or long part of one end to the obtuse angle or short part of the other, the right sides being inside.

Backstitch them together just below the raw edge, making the commencing and finishing off quite secure.

Open the joins, press them flat, and cut off the corners marked.

To fasten cross strips to any garment, adopt the methods already described.

(To be continued.)

Next Month

An interesting and helpful Article for the Teacher of Infants, by T. Maskell Hardy, entitled

THE INFANT VOICE.

Our Modern Language Section.

PHONETICS IN THE CLASSROOM.

BY S. A. RICHARDS, B.A., GROCERS' SCHOOL, HACKNEY DOWNS.

(*First Paper.*)

THE question is often asked, "Is it really possible to acquire a good French accent without living for some time in France?" The answer is not only that it is possible, but that it is a fact that better results can be obtained in six months by a scientific study of the sounds of a language than by a residence of considerably longer duration in the country in which it is spoken. Experience proves this to be true. How many people one meets who have lived in France for quite a long time, who speak the language fluently, if not always grammatically, and who are yet quite unconscious of the fact that their pronunciation is very bad indeed.

A little thought will show us that this state of things is only what might be expected. Until the ear is trained, it is unable to perceive slight differences of sound to which it has not hitherto been accustomed. The consequence is that English people who try to "pick up" a correct French pronunciation by imitation only, on meeting with a new sound are content to substitute the one which most closely resembles it in their own language. Thus one hears, for example, *avoir* pronounced with the vowel sound of the English word "have," and even—to take an extreme case—the French *rue* closely resembling the word similarly spelt in our own language.

In many cases the speakers are quite unconscious of any defect in their pronunciation. In others they feel there is something wrong, but cannot quite tell what it is. This is not at all surprising. Even if we hear correctly—a much more difficult thing than people often imagine—it does not follow that we shall be able to reproduce the sound heard. A music master might as well expect his pupil to play the violin from simply hearing his own performances upon the instrument.

The movements of tongue, lips, and jaw in producing the sounds of a language are far more complicated and rapid than those of the fingers in playing upon the violin. Let us take, as an example, the sound of the French *u* as in the word *vu*, a sound which invariably troubles English students. Why is it so difficult? Simply because it involves a combination of lip and tongue positions which does not occur in English. Keep the lips rounded as for the vowel in "too," and *at the same time* the tongue raised as for the vowel in "he," and you will produce it correctly. But who is likely to hit on this combination by chance in the course of his efforts to imitate the sound as he hears it? Any number of similar examples might be given in illustration of the fact that imitation is not an adequate means of acquiring a correct French pronunciation, and that the only efficient method consists in regular practice based upon a scientific analysis and explanation of the sounds of French and of the way in which they are produced—in other words, the study of phonetics.

A thorough grasp of phonetic principles must therefore form part of every modern language master's equipment. Happily this is within the reach of all. A careful study of such a book as B. Dumville's *Elements of French Pronunciation*, or Rippmann's *Elements of Phonetics* (Dent), will provide all that is required; while for an annual payment of three shillings the enthusiastic teacher may become a member of the Association Phonétique Internationale, and regularly receive the *Maître Phonétique*, which is printed entirely in phonetic script, and thus furnishes him with ample matter for practice. Application should be made in the first instance to Dr. A. T. Baker, Sheffield University, the English representative.

Given, then, the necessary knowledge on the part of the teacher, and a suitable text-book for the class—preferably one in which the first twenty or thirty lessons are printed in phonetic script—on what lines should the teaching proceed? Obviously the first stage will consist in a study of the sounds considered separately and without reference to words.

Start with the triangle of vowels. Either draw it on the board or procure a phonetic chart. Take each vowel separately, beginning with the front vowels. Let the class hear the sound; describe the tongue and lip positions, drawing illustrative diagrams if possible. Then let the pupils try to reproduce it, singly and in chorus. Do not leave it till you are satisfied with the result, and feel sure that every one has lips and tongue correctly placed.

When all the front vowels have been mastered, let the class recite them in succession, beginning at the top—i, e, ɛ, a. Proceed in the same manner with the back vowels, carefully explaining the different action of the tongue and the rounding of the lips in their case. The latter they will learn best from watching the teacher's lips, provided he is careful to place himself so that they can be clearly seen, and to let their action be vigorous and distinct. In some cases illustrations may be drawn from English words—[i] as in English "me," but with the muscles of the tongue tense, a very important point; [ɔ] as in English "naught;" [*u*] as in English "too," and so on. In others the approximate English sound should be contrasted. Thus the English *a* and *o* in "may" and "mow" are diphthongs, whereas [e] [o] are pure vowels.

This is a most important point. It is a most difficult thing to get English, and especially London boys, to produce pure vowels; but it must be done. The best test is that of repetition. Get the class to repeat the sound *a* as in "may," and to notice the accompanying movement of the tongue at each repetition. Show them that this sound is represented phonetically by [*ei*], and that [*e*] is a simple or pure vowel. Impress upon them the necessity of keeping tongue, lips, and jaw rigid while producing it. Do the same for [o], which in English is, phonetically, [ou]. Contrast [a] as in *malade* with the sound of English "mat." These

three vowels present the greatest difficulty up to this stage.

The front rounded vowels are more difficult still. Their relation to the corresponding front and back vowels must be clearly shown. Explain that [y] is [i] with lips rounded to the [u] position. Proceed from one to the other, the class repeating [i]—[y], [y]—[i], [u]—[y], [y]—[u], [i]—[y]—[u], and so on. Devise similar exercises for the other front-rounded vowels.

The nasal vowels present special difficulties, owing to the fact that we have none in English; but space forbids a discussion of their treatment now.

It will be noticed that I have enclosed phonetic symbols in square brackets throughout.

FRENCH PRIZE COMPETITION.

RULES.

1. All translations should be **posted not later than February 8, 1907,** and addressed:—PRIZE EDITOR, Office of *The Practical Teacher*, 35 and 36 Paternoster Row, London, E.C.
2. Competitors should cut out and send the Coupon which appears on the Back Wrapper page of the current number.
3. Competitors should write pseudonym only on MS. Prize-winner will be asked to send name and address for publication.
4. No competitor may take the prize offered more than once in three months.

A Prize of Half a Guinea is offered for the best rendering into English of the following extract:—

"L'homme les trouve devant lui, concurrentes et rivales, dans les écoles, dans les hôpitaux, dans les administrations; mais au foyer l'ordre antique se rétablit. Avec tout son cœur, avec tous ses sens, la femme aspire à la servitude amoureuse. Elle n'a pas le courage de la liberté; elle n'a pas le sentiment de sa dignité; elle n'a que le désir et le regret de l'amour. Que l'amant aimé marche sur elle, elle lui baisera les pieds et dira 'Encore!'" Mademoiselle Bon écoutait Josanne sans protester. La jeune femme s'animait, presque aggressive: "Mariées, elles ne peuvent pas s'affranchir de l'époux; libres, elles ne veulent pas s'affranchir de l'amant. Ce sont des serves, comme étaient leurs mères, comme seront leurs filles." "Ce sont des femmes," dit Mademoiselle Bon, en souriant. "Elles sont nées à une époque de transition, et elles se révoltent contre une morale et des lois dont elles subissent la contrainte. De toutes parts, la société limite l'effet de leur rebellion. Elles n'accordent pas toujours leurs actes avec leurs idées?—Ainsi les anarchistes font leur service militaire et paient l'impôt.—Elles gardent l'instinct de la servitude amoureuse?—N'oubliez pas que les siècles et les siècles ont façonné leur sensibilité pour l'obéissance et le sacrifice.—Elles aiment des gens indignes d'elles?—Mais les erreurs sentimentales seront toujours possibles, en tout temps, malgré toutes les évolutions de la morale. De même les progrès de l'hygiène et de la médecine n'empêcheront pas les maladies. Ne raillez pas les femmes qui ont brisé les vieilles chaînes, parce qu'elles traînent encore les tronçons! Vous-même, Josanne, ne faites-vous pas l'apprentissage de la liberté? Si vous vous sentez lâche, ne découragez pas les autres."

From "La Rebelle," by MARCELLE TINAYRE.

RESULT OF THE JANUARY COMPETITION.

The prize is awarded to "M. L. N." (Will "M. L. N." kindly forward name and address for publication?)

First Class.—Sorbonne, Kratos, Lily, Comet, Winnowsty, Secundus, Kettering, Votrem, Uim Bog, Meithrinva, Carol, Ten, T. V. D., Noch einmal, Trans, Aquina, Colenso, Chrysanthemum, Keeldees, Phil, Ternan, Montrose, Agaznog, Ty Gwyn, Perseus, D'Arcy, Max, Jacomo, Bonne Aventure, Janus, Gypsy, 691st, F. M. S. W., Cléopâtre, Imogen, Marcus, Sheensbreck, Borderer.

Second Class.—B. D. V., Französisch, M. I. C., Yllop, Lytton, Eripan, Trilby, Novice, Don, Rose de Chine, Chênes, Lorelei, Margaret, Snowdrop, Llwyddianus.

The name and address of "Agonzag," the successful competitor last month, are—Miss Annie Keating, St. John's Priory, Banbury, Oxon.

Report.

Considering the nature of the extract, some very good papers have been sent in. *Le lieu des volontés* was translated in many instances with too severe literalness, and the paradox involved in *qui ne veulent rien, mais "qui le veulent bien,"* was missed by some, who took *vouloir bien* in its sense of "to consent" or "to be willing." The adverb *bien* here retains its primitive force, and is not the somewhat weak and colourless word it is when used in the way mentioned above. An amusing instance of what results when a strong imagination is combined with too cursory a study of the text is afforded by the translation of *Dirai-je qu'elle habite trop haut?* which was rendered by, "Shall I say that she dresses above her station?"

The editor will be pleased to answer the letter of Uim Bog if the competitor will kindly forward name and address.

Prize Translation.

Whatever any one may say, the passions do not really control the will, they only divert it from its natural course; and if, as I maintain, history is the theatre of passions, it is, at the same time, what I may call "the battlefield of the will." You know, gentlemen, and you also, ladies, that it is not feeling which governs the world. This, the characteristic trait of women or dilettantes, is too delicate, too easily moved, or rather surprised, and therefore easily deceived; much work is repugnant to it; in the end it paralyses action more often than it helps it. Nor is intellect the governor of the world. Shall I say that it moves too high, or in a sphere too far removed from the present life; or perhaps that it discerns too clearly the strength and the weakness of things, the pros and the cons, and that, for example, even in applying the principles of justice, it always finds some trace of injustice involved. It has, moreover, something in itself with which to be satisfied, and I do not remember that any Plato has dreamt of changing the pure joys of contemplation for the delights of action, which appear so great, but which are always so troubled and so short. But in the will we behold the mistress of the world. Those who will, those who know how to will, those even, as it has been said, who will nothing but will it well—these are they who lead us. We champ the bit which they force upon us, but we submit to it. We turn against them one day, we revolt, we overthrow them; but we have followed them, and we cannot again stem the stream into which they have drawn us. M. L. N.

RECENT MODERN LANGUAGE BOOKS.

BLACKIE AND SON, LIMITED, LONDON.

Die Zwei Brüder (Grimm), edited by A. R. Hope Moncrieff; **Die Ostereier** (Christoph von Schmid), abridged and edited by A. R. Hope Moncrieff; **Der Vetter aus Bremen** (Theodor Körner), edited by Ch. H. Clarke, Ph.D., senior Modern Language Master, Campbell College, Belfast; **Le Siège de la Rochelle** (Mérimée), edited by J. E. Michell, M.A., Westminster School; **Les Jumeaux de l'Hôtel Corneille** (Edmond About), edited by J. Havelock, M.A. Oxon.

These additions to the *Little German Classics* and the *Little French Classics* series of Messrs. Blackie fully sustain the reputation which these have already acquired. Suitable selections of varied tone, annotated, and clearly printed, are presented in a form very convenient for class use.

German Reader. By W. Scholle, Ph.D., and G. Smith, M.A. This excellent reader is for those who follow the "direct" method, and forms a companion to *First Steps in German* and *First German Grammar*. The subject matter of the selections therefore all comes within the experience of the average pupil, or deals with geographical and historical subjects. We heartily commend the simple notes in German.

OUR TUTORIAL SECTION

SCHOLARSHIP COURSE FOR 1906-7.

BY ARTHUR T. FLUX,

Late Principal of the Belvedere Pupil-Teacher Centre; First on Scholarship List; Author of "Scholarship School Management," "Building of the British Empire," etc.

Work for the Month.

PART II.

1. *English Grammar and Literature.*—

(*a*) Common mistakes in spoken and written English.

(*b*) Abbott and Seeley—Part IV. Hints on selection and arrangement.

(*c*) Read *A Midsummer Night's Dream.*

(*d*) Read the next twenty poems in the *Golden Treasury*, or any good collection of poems.

(*e*) Read any or all of the following—Scott's *Rob Roy, Waverley*, Thackeray's *The Virginians*, Dickens's *Barnaby Rudge*, Doyle's *The Refugees*, Grant's *Romance of War.*

Notes.—(*a*) The commonest mistakes in English arise either from violation of some of the rules of syntax, or through the misapplication of some word, the latter being due generally to an ignorance of its etymology. The chief of such mistakes are dealt with in the *English Notebook for Pupil Teachers*, and most good text-books give exercises on the correction of such mistakes. Space does not admit of dealing fully with them here, but students should certainly give considerable attention to the point, so as to be able to detect them quickly and modify them correctly. The following are typical errors, which the student can correct:—

(1.) He parts his hair in the centre.
(2.) He laid down on the sofa.
(3.) Sorrow not as them that have no hope.
(4.) They summonsed him for trespassing.
(5.) The fairest of her daughters, Eve.
(6.) I asked him to quickly close the door.
(7.) The cake was divided between half a dozen children.
(8.) Walking in the road, the snow wetted my feet.
(9.) Thou, Nature, partial Nature, I arraign.
(10.) The bright sun peeps in every little crevice.
(11.) When distress and anguish cometh upon you.
(12.) The Thames is derived from the Latin Tamesis.

(*b*) This section of Abbott and Seeley gives some very valuable advice on the selection and arrangement of matter when writing, advice which any student of composition would do well to lay to heart. In writing any essay, or, in fact, any answer on a general topic, there are generally more ideas than can be utilised; and it is a valuable acquisition to be able to select at once the best and arrange them in methodical order. Essays and answers are frequently spoiled by the inclusion of matter which is either irrelevant or too trite and commonplace to be used.

(*c*) The *Midsummer's Night Dream* differs from all other Shakespearean plays. We find in all the other plays, comedies, or tragedies a definite plot or line of thought which runs through and predominates the whole. The movements are in logical sequence, and arise naturally from what has preceded, and there is little difficulty in at once grasping the leading idea or motive. But in the play before us this is not so. It must be considered, as its name implies, as a "dream," wherein the actions are inconsequential, the complications wonderful, and the laws of time and place entirely disregarded. As has been well said, "The whole thing swarms with enchantment; all the sweet witchery of Shakespeare's genius is concentrated in it, yet disposed with so subtle and cunning a hand that we can as little grasp it as get away from it. Its charms, like those of a summer evening, are such as we may see and feel but cannot locate or define, cannot say they are here or they are there. The moment we yield ourselves up to them, they seem to be everywhere; the moment we go to master them, they seem to be nowhere." It is enough for us that we should, in the right spirit, wonder and admire, appreciate and enjoy this wonderful creation, without endeavouring to find out some hidden meaning or definite plan of construction. Shakespeare has summed up the situation in the words of Bottom, "Man is but an ass, if he go about to expound this dream." Although the title calls it *A Midsummer Night's Dream*, the action belongs to the end of April and the first of May. It may have been produced on Midsummer Eve, but more probably the title refers to the widespread superstitions of fairy agency being particularly active on St. John's Eve. Read the play to enjoy it, and not to criticise or dissect it; you will be attempting the impossible.

(*e*) Any historical novels dealing with the eighteenth century may be read with advantage, if they assist in explaining the mode of life, social problems, or historical events of the period. In *Rob Roy*, Scott gives us a vivid picture of the life in Scotland at the time of the Jacobite plots; *Waverley* deals with the insurrection of 1745; *The Virginians* depicts for us the events on the eve of the American War of Independence; *Barnaby Rudge*, the Gordon Riots. In Conan Doyle's *The Refugees* the scene is laid at first in the court of Louis, "Le Grand Monarque," and deals with events immediately preceding his marriage and the revocation of the Edict of Nantes; the second part gives an excellent picture of life on the frontiers in America, and the bloody wars which were waged with the Iroquois. *The Romance of War* follows the hero through the principal campaigns in the Peninsular War. Another book which all students would do well to read is Fitchett's *Fights for the Flag.* It deals with the chief battles in English history, is of fascinating interest, and most trustworthy as to facts.

TEST PAPER ON ENGLISH.

(If any difficulty is found with the questions, students should write for assistance.)

(1.) Where and by whom were the following words spoken:—
(*a*) I would rather be the author of that poem than take Quebec.
(*b*) I doubt I have slain the Red Comyn.
(*c*) Play the man, Master Ridley.
(*d*) I am your king; I will be your leader.

(2.) Explain the following phrases:—
(*a*) To show the white feather.
(*b*) To bell the cat.
(*c*) To run the gauntlet.
(*d*) To cut the Gordian knot.
(*e*) To send to Coventry.

(3.) Who wrote the following:—*Gulliver's Travels, Westward Ho! Wealth of Nations, Oliver Twist, Vanity Fair, Two Years Ago, Canterbury Tales, Robinson Crusoe?* State approximately when the author lived.

(4.) The following quotations are from Shakespeare. Name the play in which each occurs, and, where you can, give the name of the speaker and the occasion:—
(*a*) Once more unto the breach, dear friends, once more.
(*b*) To be or not to be, that is the question.
(*c*) Thou diest, and all thy goods are confiscate.
(*d*) Heat me these irons hot.
(*e*) I am that merry wanderer of the night.
(*f*) Now are we in the Forest of Arden.

(5.) Distinguish between the following pairs of words, and use each properly in a sentence—Adoration, worship; part, portion; politician, statesman; unlikely, improbable; distinguish, discriminate.

(6.) Mention ten historical novels, each illustrating one period of history. State the writer, and give a brief synopsis of the contents of one book.

(7.) Comment on the use of the infinitives in the following. Point out their syntactical relations:—
(*a*) Better dwell in the midst of alarms
Than reign in this horrible place.
(*b*) To be content his natural desire.
(*c*) He knew himself to sing.
(*d*) For not to have been dipped in Lethe's stream
Could save the son of Thetis from to die.
(*e*) Man never is but always to be blest.

(8.) Distinguish between metaphor and hyperbole, and give instances.

ESSAY. (40 minutes.)

Write an essay of about forty lines on one of the following subjects:—

(*a*) The characteristics of a prig.
(*b*) The reasons which lead nations to go to war.
(*c*) Arguments for and against a Channel tunnel.
(*d*) The chief aim in life.

Consider the subject carefully first, and jot down the chief points that occur to you. Arrange them in a logical order, and write in the best English at your command. Open the essay with a good sentence, and let the last paragraph be a fitting conclusion.

The following notes may be of assistance:—

(*a*) Define the term: a pert, conceited, pragmatical person. Analyse the qualities which make up the character. (1.) Ignorance. The ignorant person alone is positive; the deeper one studies any question, the less ready is he with a decided opinion. (2.) Conceit, which arises from the former: a little knowledge is a dangerous thing. (3.) Self-assertion, which naturally arises from a combination of the other two.

(*b*) These are as various almost as the wars that occur.

(1.) To preserve the balance of power—for example, England in the War of the Spanish Succession.

(2.) To repel invasion and preserve nationality—for example, Spain in the Peninsular War.

(3.) For personal aggrandisement—for example, the wars of Napoleon.

(4.) To obtain political or religious liberty—for example, the American colonists in 1775, and the Thirty Years' War.

(5.) To detract attention from home government—for example, Napoleon the Third in the Franco-Prussian War.

(6.) For conquest—for example, Alexander's wars.

(*c*) This subject is being widely discussed at present. The narrow Strait of Dover has more than once proved a bulwark of England's liberty; but, at the same time, it cannot be denied that it is a serious hindrance to trade and to travelling. More people would visit France but from a fear of the crossing. The arguments against it are mainly (1) the immense cost (there would be little difficulty from an engineering point of view), and (2) the fear expressed by many that it would afford a means of easy invasion from France. This is more a matter of sentiment than of practical strategy. The tunnel might be, by treaty, made neutral, or, in any case, it would be easy to destroy a part of it if invasion were feared. But even if the tunnel were open it would be difficult to pass an army through it. The reasons for are: (1.) It would be of great advantage to trade. A truck could be loaded at Manchester, and run right through to Milan without the transposition of goods from rail to boat, and again from boat to rail. (2.) It would assist materially in the interchange of perishable goods, which are damaged by frequent handling. (3.) It would facilitate travel, and increase the *entente cordiale*. If the whole concern were taken up jointly by the English and French Governments, it would undoubtedly be a great success.

(*d*) This is a question which has engaged the minds of thinking men in all ages. The answer would vary considerably with the individual and his surroundings. The Epicureans considered pleasure as the chief aim; and there are many of the sect to-day, although they would not perhaps recognise themselves under the title. The Stoics considered it a phase of existence wherein the immortal mind is clogged by a sentient body, and the chief aim should be to prohibit the body being affected by any outside circumstance. The Buddhist regards life as a stage towards the Nirvana, which is attained by acquiring merit and by mental abstraction. The Christian doctrine is the noblest of any creed. "Whatsoever thy hand findeth to do, do it with thy might." This is the gospel of work. The whole of the Christian teaching emphasises this by precept and by example. "If any man will not work, neither let him eat." By work, and work only, does man justify his existence. The talents, be they one or ten, must be put to account, and not allowed to lie idle. And by the term "work" must be understood not merely the manual or mental labour for which we are paid, but a strong striving upwards and onwards, not for selfish purposes but for the good of all, aiming not at the aggrandisement of the individual but at the uplifting of all humanity. The realisation of such an aim is not easy or pleasant, but it is right. As Kingsley says,—

"Do the work that's nearest,
Though 'tis hard at whiles,
Helping, when you meet them,
Lame dogs over stiles."

If only one-tenth of the effort made in this money-loving age at the gratification of selfish desires were directed towards the assistance of others, it would be a better and a happier world.

2. *History.*—1727–1815.

Notes.—(1.) For twenty-two years during the reigns of George the First and George the Second the government was in the hands of Walpole, who was a most skilful financier, and who did much to place the financial affairs of the kingdom upon a sound footing. Strongly opposed to war, he yielded to the clamour against Spain with the remark, "Now they are ringing their bells, but they will soon be wringing their hands." An account of his rule must be carefully read. He maintained his position largely through bribery—"Every man has his price;" and although it was easy for the Opposition to bring many true charges against him, he must be regarded as one of England's greatest ministers.

(2.) One result of setting up the Hanoverian dynasty in England was to embroil the country in disputes into which, under other circumstances, it would never have entered. The foreign policy was primarily to defend Hanover, and the greatest enemy to be feared was France. It was owing to this fact that England took part in the War of the Austrian Succession. The Emperor Charles the Sixth was emperor of Germany—a title which meant little—and actual ruler of his hereditary possessions—Austria, Hungary, Bohemia, and the Netherlands. Having no son, Charles was anxious to secure the peaceful succession of his daughter, Maria Theresa. An arrangement—termed the Pragmatic Sanction—was made with all the chief powers of Europe that she should succeed, although it was against the Salic custom. On his death, however, Frederick of Prussia seized Silesia, France promptly joined, and England, fearing for the safety of Hanover, also took part. The only event of importance was the Battle of Dettingen, where the English troops, being cut off from their supplies, put to rout a French army opposing them. The French were defeated, Carlyle says, because they stood between the English and their food. There was nothing of brilliant strategy in the fight; the advance of the English was dogged and irresistible. The war ended by the Treaty of Aix-la-Chapelle, the only gainer being Frederick, who still held Silesia.

(3.) The rebellion of '45 failed because the common sense of the nation as a whole told the people that they were better off under a government such as had been secured by the Act of Rights than they could be under the Catholic Stuarts.

(4.) *The Seven Years' War.*—The thoughtful student will have observed that the foreign policy of England was becoming more and more important. Hanover, as mentioned above, was one cause. In America the colonies extended from the St. Lawrence to Florida, and were bounded on the west by vast forests and plains stretching to the Mississippi. These forests were inhabited by races of Indians, generally hostile; but the colonists hunted and traded for skins as far as the Great Lakes, and even drew on the fur supplies of the great North-West. The French held Canada—that is, they had a few stations at wide intervals on the banks of the St. Lawrence—and they considered the fur trade as their monopoly. Bickerings between them and the English were continual. In 1752 the French governor commenced a plan to confine the English to the seaboard by erecting forts at intervals from the Richelieu to the Ohio, down the Ohio to the Mississippi, and thence south to the French colony of Louisiana. Had this been completed, the English colonists would have been completely hemmed in. In India the English East India Company and the French Company were continually fighting, although the countries were nominally at peace, by taking opposite sides in the petty wars which were continually waged by the native princes.

There were therefore, in 1756, three good reasons why England should engage in war with France, and the outbreak came through Frederick of Prussia. Maria Theresa, smarting under the loss of Silesia, had spent the years 1748–56 in forming a huge coalition against Frederick. Austria, France, Saxony, Russia, and Sweden were to attack him simultaneously; but Frederick forestalled them by suddenly attacking Saxony and destroying its army. The war broke out; and England joined Frederick, not because it approved of his actions, but merely because he was opposed to France. For details of the desperate fight which Frederick maintained successfully for seven years, and which gained for him the title of "Great," the student should read Macaulay's essay on Frederick. With the war in Europe England had little to do, but it supplied Frederick with £700,000 a year, which was perhaps better to him than an English army.

The results in America and India, however, were stupendous. The war opened badly for England. The colonists were hard pressed, when Pitt took charge of affairs. From this time onwards the English were everywhere successful. Pitt had the talent of choosing the right men to do the work, and 1759 is called "the most

glorious year that England had seen," from the long roll of successes. In America the British captured Ticonderoga, Fort Niagara, and Quebec; Rodney bombarded Havre; Boscawen defeated the French fleet at Lagos; Hawke blockaded Brest, and gained a decisive victory in Quiberon Bay; while in India the final blow at French supremacy was struck by Eyre Coote's decisive victory at Wandewash. The results of the Treaty of Paris, 1763, were of the greatest importance. England acquired Canada, Nova Scotia, Cape Breton; in the West Indies, Tobago, Dominica, St. Vincent, Grenada; in Africa, Senegal; in India the French military establishment was to be broken up, and this gave the English illimitable power. Read Macaulay's essay on Clive.

(5.) The affair of John Wilkes is important in one respect. Why should the people shout "Wilkes and liberty"? Personally he was not a good man, but he represented a *cause*—namely, the right of the newspapers to criticise the actions of the Government. It must be remembered that the House of Commons at that time did not represent the people, and it was felt to be intolerable that a man should be prosecuted for criticism on the conduct of ministers who were really responsible to the people.

(6.) *The War of American Independence.*—What were the causes which produced the rebellion of the colonies, and how was it that a comparatively small number of agriculturists and hunters were successful against the trained armies of England? These are the questions to which the thoughtful student will naturally endeavour to find an answer.

(*a*) The attitude of the Home Government to the colonies was radically wrong. The thirteen colonies scattered along the Atlantic slope had been founded at different times for different purposes, and possessed different forms of government. They were regarded as possessions held only for convenience of trade. To supply unskilled labour, numbers of convicts had been sent to the tobacco and rice plantations, and Johnson's opinion that the colonists ought to be content as long as they were not hanged was shared by many of his contemporaries. The colonists were not allowed to trade freely with other countries. They had to take what was sent to them from England at as high a price as the English manufacturer chose to set.

(*b*) The character of the colonists was entirely misunderstood. Instead of being a puny, downtrodden race, the people had developed under the pure air and beautiful surroundings into an energetic and bold people. Accustomed to continual warfare with the Indians, they were keen of sight, clean and strong limbed, dead shots, and dominated with an intense love of freedom, which only comes to men who have wide spaces to live in. The heroic deeds of some of the early settlers, such as Du Lhut, Robertson, Daniel Boone, etc., were entirely unknown in England, or the colonists would have been held in higher esteem. Notwithstanding the injustice of the trade laws, they were loyal, but their loyalty was based upon constitutional freedom.

(*c*) The Seven Years' War had cost England much money, and as it had been undertaken largely for the colonists, it was thought right that they should contribute towards the expense. A fleet was sent to stop the clandestine trade with the Spanish islands, troops were quartered on the colonists, and a Stamp Act passed, all legal documents to bear stamps varying in price from 3d. to £10. The opposition to the latter was unanimous and prompt. The colonists protested against taxation, not because they were unwilling to pay, but because it was a violation of the principle which had been established in England after centuries of dispute, that those taxed should have the right of representation in the House of Commons. The position of the colonists was sound. The repeal of the obnoxious Act gave strength to their conviction. The import duties upon glass, red and white lead, painters' colours, paper, and tea were as strenuously opposed, and they were dropped with the exception of that on tea. Then followed the seizure of tea at Boston, and the outbreak of hostilities.

(*d*) The colonists entered upon the struggle with diffidence, and with the sincere hope for a peaceful solution of the difficulties. The action of the Home Government drove them finally into a resolve to break away from England, and make themselves an independent country. As hostilities proceeded their hopes of success increased. The English fought in dense bodies, according to the European plan; the colonists in the method they had learned from the Indians, with a wholesome regard for their own safety and a deadly aim for their opponents. The colonists were at home, the British were far from their base of support; the colonists knew the country, the generals sent against them did not. France, smarting under the loss of Canada, joined them. Spain, anxious to regain Gibraltar, did the same. Holland also declared war, and England was beaten all round. Two incidents alone upheld the national fame. Gibraltar withstood a tremendous assault, and Rodney gained a magnificent victory over the French in the West Indies at the Battle of the Saints.

(7.) For affairs in India the student should read Macaulay's brilliant essay on Warren Hastings.

(8.) *French Revolution.*—Causes. The Feudal System still remained, though hopelessly out of date. In England the peasants' revolt had succeeded, serfdom vanished, and a great middle class had sprung up. In France the Jaquerie had failed, and there were two classes only—the nobles, who did no work, were not taxed, took all the money, and spent it in selfish pleasures; the peasants, slaves to the nobles, who provided *all* the taxes, and never had any leisure or pleasure or hope of advancement. The costly building schemes of Louis the Fourteenth and the long wars had reduced the country to the verge of bankruptcy. The people were taxed till it was impossible to levy more, loans could not be raised, bad harvests brought starvation to thousands, and finally the king was compelled to call together the Parliament and include in it the *Tiers Etat*, representative of the people.

Measures of reform were passed, but events did not proceed rapidly enough for the mob in Paris and other large towns, who took matters into their own hands, and produced a revolution. The ill-advised invasion of France by Germans and Austrians raised the people to a fury of white heat. The nobles were massacred in hundreds, and France became a great camp. The invaders were repelled, and soon French armies were, in their turn, pouring over the frontiers with offers of help to any people that would throw off the yoke of monarchical government. Into the details we cannot go, but it must be noted that France found some very clever generals—for example, Hoche, Moreau, Pichegru, Napoleon, etc.; the French eagles flew wide over Europe.

In England the Revolution was viewed with mixed feelings. At first the people sympathised with the French in their struggle for freedom, for had they not done the same; but the excesses of the mob, the massacre of the nobles, and the execution of the king alienated their sympathy, and when the legitimate aspirations for liberty developed into illegitimate dreams of conquest war was undertaken. For twenty years the genius of Pitt kept Napoleon from realising his wishes, and the National Debt was increased by 600 millions.

The careers of Nelson, Wellington, Bonaparte, and Pitt must be studied. Plans of the chief battles should be learned, and in each case the student should notice why the battle was fought, how it was won, and what were the results of it.

Citizenship.—Next three chapters of Peaker's *British Citizenship.*

Special Period.—Victoria, 1860–1870.

The chief points are the death of the Prince Consort, New Reform Bill, the war in Abyssinia, the Disestablishment of the Irish Church, the Irish Land Act, and the Elementary Education Act of 1870.

Test Paper.

(The following are last year's questions. *Two hours* were allowed for the questions in Section I., *two* in Section II., and *two* in Section III.)

Section I.

(1.) Give the modern names of Camolodunum, Deva, Eboracum, Verulamium, Venta Belgarum, with notes on their importance; and describe as accurately as possible the positions of Silchester, Watling Street, High Cross, and the walls of Hadrian and Agricola.

(2.) Narrate shortly the progress of Christianity in Britain from the landing of Augustine to the death of Dunstan, making special reference to Penda of Mercia, Aidan, the Synod of Whitby, Theodore, and Dunstan. How did Christianity affect the position of the more helpless of the Anglo-Saxons?

(3.) Point out how the Roman, Saxon, and Norman conquests differed in character. Describe the events of the year 1066 from the arrival in England of Hardrada to the Battle of Hastings. Do *not* describe the battle.

(4.) Draw a sketch map to show the dominions of Alfred and the Danelagh, as settled by the Peace of Wedmore, and narrate the second Danish invasion in the reigns of Ethelred and Edmund Ironside (988–1016), pointing out the causes of Danish success.

Section II.

(5.) Describe the differences between the Saxon and Norman armies' equipment and tactics at Hastings, and between English and French at Crécy and Agincourt. Give a clear account of any *one* of these battles, or of the Battle of Bannockburn.

(6.) Stephen's reign "was the period at which for once the feudal principle got its own way in England. It proved the wisdom of the Conqueror and his sons in repressing that principle, and it forced on the nation and its rulers the reforms by which

in the succeeding reigns the recurrence of such a result was made impossible." Explain and illustrate each of the above statements.

(7.) The plague of 1349 produced some marked social changes. Mention some of the latter, and compare the troubles of 1349 with those of 1549.

(8.) Narrate clearly, with a sketch map, the campaign of Henry the Fifth which ended in Agincourt. Describe a characteristic mediæval siege—for example, Calais or Rouen.

(9.) What were the principles upon which Elizabeth dealt with religious difficulties throughout her reign? State what you know of (1) the Jesuits, (2) the Puritans. Explain Elizabeth's long detention of Mary Queen of Scots, her reluctance to order her execution, and her final consent.

(10.) Give a distinct and fairly detailed account of the progress of the Armada from the time it was sighted until it reached Spain again, illustrating your answer by a sketch map. Describe the tactics of the English commanders.

Section III.

Welsh history.

Section IV.

(11.) Examine the conditions under which Henry the Seventh began his reign, and compare them with those at the accession of Elizabeth. His reign is called the "Age of Beginnings." Name these beginnings, and trace the development of any one of them

(12.) How do you account, first, for the uncontrolled despotism of the crown under Henry the Eighth; and, secondly, for the fact that such despotism did not continue after his death? Describe Thomas Cromwell's reign of terror, and account for his sudden downfall.

(13.) The monasteries performed so many functions in English life that their sudden destruction caused widespread confusion and trouble. Discuss both parts of this statement. How far is it true to say that England was Protestant in the reign of Edward the Sixth and Catholic in that of Mary?

(14.) What were the causes of quarrel between England and Scotland in the reign of Henry the Eighth? Narrate the circumstances leading to the Battle of Pinkiecleugh, and explain carefully what is meant by the following remark, "Somerset ruined Henry's plan with regard to Scotland."

3. *Geography.*—Work for the month.

(1.) Physical: climate, causes affecting (latitude, elevation, slope, etc.); isothermal lines and climatic zones; isobars; distribution of plants and animals.

(2.) Revise the geography of England.

(3.) Prepare the chief trade routes of the Continent—railways and steamship lines.

(4.) Revise the geography of Australia.

Notes.—The meteorological conditions, which we term "climate," must be carefully prepared. The chief causes affecting climate are—(1) distance from the equator; (2) altitude above sea-level; (3) slope towards or away from the sun; (4) position of mountain chains; (5) direction of prevailing winds and ocean currents; (6) character of the vegetation. Trees and forests cause rain; barren and arid districts, such as the Sahara, are to a large extent rainless.

In revising England, pay particular attention to industries, imports and exports, and means of communication. The question is sometimes asked why England, which pays ten millions more for her imports than she gets for her exports, is in a flourishing condition. At first sight it appears paradoxical; but it must be remembered (1) that England does a large carrying trade for other countries, thereby earning money, and (2) that there are enormous sums of English capital invested in foreign industries and stocks. The income from these two sources more than makes up the deficiency.

Students should be familiar with the chief trunk lines of the Continental railways, and the chief lines of steamers from European ports to the various ports of the world.

In revising your geography use *Test Questions in Geography* (Meiklejohn and Holden), which contains a wide selection of questions set in public examinations.

TEST PAPER. (1½ hours. Five questions to be answered.)

(1.) Enumerate the various signs used in Ordnance survey maps. Draw a sketch map of any district with which you are specially familiar, using those signs where necessary.

(2.) Enumerate the chief industries of Ireland, and explain how far they are due to geographical causes.

(3.) In England the main lines of the railways follow the directions of the old Roman roads. Discuss this statement generally, and treat of one case in particular.

(4.) Enumerate and describe the position of the British possessions and protectorates in Africa (excluding the islands).

(5.) Describe the exact position of the following places, and state their commercial importance—Canton, Kurachi, Sydney, New Orleans, Montreal.

(6.) Describe the nature and uses of each of the following, specifying the districts in which each is found—sago, amber, petroleum, jute, flax.

(7.) Give the exact position of Glamorganshire, specifying its approximate size, its chief industries, and the centres in which those industries are respectively carried on.

(8.) What are tides? How are they caused? Explain the term "spring" and "neap" tides, and show by means of diagrams the action of the sun and moon in causing them.

(9.) State roughly the limits within which the trade winds prevail, and their general direction. State where and at what parts of the year the south-west monsoons prevail.

(10.) Discuss the uses, (*a*) climatic, (*b*) political, (*c*) commercial, of mountains, being careful to give examples to illustrate your answers.

(11.) Define the terms—equator, meridian, parallel of latitude. How many degrees of longitude correspond to an hour of time? What time is it in New York (3,000 miles west of England) when it is noon in London?

(12.) Describe some useful aids which are available in making lessons in geography interesting and attractive.

(13.) What is the value of learning to draw maps from memory? Explain what points you would observe in teaching children to draw a map of England and Wales.

4. *Elementary Science.*—For this month prepare the magnetism and electricity section. Magnets, the earth as a magnet, the magnetic compass, dip, declination, development of electricity by various means, mechanical, chemical, thermal, magnetic; the effects of electric current and electro-magnetic.

5. *Mathematics.*—

(*a*) *Arithmetic.*—Finish the mensuration of common areas and solids.

(*b*) *Algebra.*—Problems leading to quadratic equations, and the theory of solution of quadratics.

(*c*) *Geometry.*—General practice in plane geometry. Work any test papers in the subject you can.

(*d*) *Euclid.*—Finish this subject as far as the propositions are concerned, and work four deductions per week.

The rules for solution of problems in mensuration are generally given concisely in any good text-book, and it is unnecessary to repeat them here. In the majority of problems students will find it of assistance to draw a diagram before working the question. The area of a uniformly wide path round a rectangle is a common basis for a question, because students either omit the corner pieces or reckon them twice. A diagram will obviate this. The simplest manner of obtaining the area of a belt is to find the area of the whole, and deduct that of the inner piece. Work the following questions:—

(1.) A map drawn on paper $\frac{1}{100}$ inch thick is divided for folding by 3 cuts across the breadth, and 5 cuts across the length. It is mounted on linen $\frac{1}{75}$ inch thick. A cardboard case is made to hold the map when folded up. The open map is 4 feet long by 2½ feet wide. Find the internal length, breadth, and depth of the cardboard case in inches.

Ans. 8 inches, 7½ inches, 1$\frac{11}{12}$ inches.

(2.) A square chessboard contains 64 equal squares, and the area of each square is 1·3225 square inches. The rim round the board is two-fifths of an inch wide. Find the length of one side.

Ans. 10 inches.

(3.) A roof measuring 18 feet along the ridge, and 10 feet 8 inches from ridge to eaves, has to be covered with slates 16 inches long and 8 broad, each slate overlapping the one below it by 2 inches. Find the cost of the slates at 16d. a dozen.

Ans. £2, 14s.

(4.) A pedestal for a statue consists of 3 square slabs. The top slab, a yard broad, rests on the next, which is a yard and a quarter broad. This rests on a slab a yard and a half broad, which rests on the ground. These slabs form a four-sided staircase, each step being 6 inches high. What will it cost to gild this pedestal at 5s. a square foot, omitting the upper surface of the uppermost slab? Ans. £8, 8s. 9d.

(5.) A tank is constructed 8 feet deep to hold 7,200 gallons. What is the width of the tank if the length is 23 feet? (A gallon = 276 cubic inches.) Ans. 6½ feet.

(6.) A rectangular block of wood is overlaid with metal of thickness ¼ inch. The whole is now 2 feet long, and the ends are square and 3 inches broad. The value of the metal used is £9, 14s. 1d. What is its value per cubic inch? Ans. 5s. 4d.

The theory of quadratic equations must be carefully studied.

OUR CERTIFICATE COURSE FOR 1907.

BY GEORGE COLLAR, B.A., B.SC.,
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Test Questions on Last Month's Work.

THEORY OF TEACHING.

1. Give an account of the articles which you consider necessary for the teaching of geography in an elementary school.
2. How may geography be used so as to train respectively the imaginative and the reasoning powers of children?

ENGLISH LITERATURE.

1. Write a short account of the part played by Roger Wildrake in Scott's *Woodstock*.
2. What are the characteristics required of epic poetry? Show that *Paradise Lost* fulfils all these.
3. What are the chief characters of Milton's style? Illustrate your answer by quotations from the first or second book of *Paradise Lost*.

HISTORY.

1. Give an outline of the Thirty Years' War, and say to what extent England was interested in the war, and its results.
2. What were the specific points in dispute between Charles the First and his Parliaments? How did they arise, and how were they eventually settled?

GEOGRAPHY.

1. Discuss the climate of the British Isles, and compare it with the climate of other places in the same latitude.
2. Name the chief railway lines going out of London. Mention the places they serve, and in two cases trace the relation between their courses and the physical characters of the districts through which they pass.
3. In what ways may a teacher encourage children's hobbies, such as stamp collecting, so as to make them of real educational value?

ARITHMETIC.

1. Prove from first principles that $\frac{a}{b} - \frac{a}{b+1} = \frac{a}{b(b+1)}$, and justify in this case the ordinary process for subtraction of fractions. Why is the L.C.M. of the two denominators used, as a rule, in calculation in preference to any other multiple? Without actually subtracting one fraction from the other, show that the difference between $\frac{5}{6}$ and $\frac{7}{8}$ is greater than $\frac{1}{10}$.
2. A wall, 5 feet high and $13\frac{1}{2}$ inches thick, is built round the two longer sides and one end of a rectangle 6 feet by 12 feet. Find the number of bricks needed for this wall, if each brick is 9 inches long, $4\frac{1}{2}$ inches broad, and 3 inches thick.

ALGEBRA.

Find the value of the following expressions:—

(1.) $$\frac{6}{x^2+x-6} - \frac{1}{x^2-3x+2} + \frac{5}{x^2+2x-3}.$$

(2.) $$\frac{x^2+5x-14}{x^2-6x} \times \frac{x^2-15x+54}{x^2-7x+10} \times \frac{x^2-5x}{x^2-2x-63}.$$

GEOMETRY.

1. Show how to draw a common tangent to two circles, and say under what conditions two circles can have four, three, two, one, or no common tangents.
2. If AD be drawn perpendicular to the side BC of the triangle ABC, and be produced to cut the circle described about the triangle in E; then if O be taken in AD, so that OD is equal to DE, show that BO and CO are perpendicular to CA and AB respectively.

ELEMENTARY SCIENCE.

1. Describe experiments that prove that water presses equally in all directions.
2. Three similar bottles of water are turned upside down—the first under water; the second free to the air; the third free to the air, but fitted with a stopper, through which a narrow hole has been drilled. Explain what happens in each case.

Notes and Syllabus for February.

COMPOSITION.

Go carefully through the sections that point out the common errors in composition, try to classify them as far as possible, and if you are inclined to make any of those errors, say the correct sentences through several times.

Prepare essays on the following subjects:—

(1.) The General Post Office.
(2.) Indoor amusements.
(3.) Some celebrated picture.
(4.) Gratitude.

PRINCIPLES OF EDUCATION.

Prepare the first half of the twelfth chapter of the text-book—that is, to the end of Junior Arithmetic.

There is very little to be added to what is written in this chapter, but the advice given is meant to be put into practice. Great importance is now attached to sound methods of teaching arithmetic, and if any of our readers require further assistance we shall be glad if they will send up their queries.

We shall now deal with some questions that have been recently set in the Certificate Examination:—

1. What practical work in connection with the teaching of elementary mathematics do you consider most useful? Sketch a syllabus either for the highest or the lowest class.

It will be noticed that this question is very general, and so it gives scope for varieties of opinion and for great differences of treatment. In the first place, the "practical work" need not be a part of the actual mathematical teaching, so long as it is "in connection with" it. Again, we are without a definite standard of utility. What is most useful to one pupil may not be most useful to another; and, again, many people draw a distinction between disciplinary subjects and useful subjects, as though the training of the mind was a *useless* operation. The form of the question rather suggests that work is required which is most useful in gaining a livelihood. Now among the most useful exercises from this point of view we may mention the following:—

(1.) *Those which lead to the power of rapid and accurate addition.*—It is surprising how many people are weak in this fundamental operation. One has only to go to a "progressive whist party" to find how many of the players cannot total up their tricks at the end of the game. One of the best ways of imparting the power of rapid addition is by the use of "long tots," which may be in either simple or compound addition. Pupils must be trained in giving only the total after adding each digit to the previous total. Thus, if the vertical column of digits contained 3, 5, 9, 2, 6, he should say 3, 8, 17, 19, 25, and not "3 and 5 are 8, 8 and 9 are 17," etc. The two plans given on page 228 should also be taught. The method of proof by casting out the nines should be taught to the older children. One obstacle in the way of dealing with long tots is the labour imposed on the teacher in setting the sums and checking the result. The following plan will reduce this labour to a minimum. In simple sums arrange each pair of lines so that their sum is 1,000, 10,000, or 100,000. This is easily done by writing down a line of digits at random—say, 369,252; then in the next line write under the units digit a digit that will give 10 when added to the 2, and under each of the others a digit which will give 9 when added to the one above it: thus in this case the second line will be 630,748. Suppose we set down at random 953,065 as the third line, then the fourth line will be 46,935. We should set down four or five such pairs of lines, and their total will be four or five millions—that is, one million for every pair of lines. If we had eight lines the answer would be 4,000,000; but children would soon get into the way of writing down a set of noughts with a digit at the left, so we set in an odd line at random after one of the pairs of lines—say, 324,716 after the first pair. Then the answer will be 4,324,716. It may be supposed that a sharp child would see the connection between the third line and the answer, and take to writing down the third line with a four in front instead of working the sum. By writing the key line at the fifth instead of the third, the teacher can detect at once whether this is being done. But by using a pair of lines for the key the teacher can avoid all fear of this; and, at the same time, by writing a fresh line at the bottom a fresh exercise is given. Thus after writing a number of pairs of lines in the manner described above, he can write two lines at random, or with a preference for digits that are easily added—for example, 231,042 and 124,315. The sum of these two lines he sees at a glance is 355,357; and so if he has used four pairs of complementary lines, with six digits in each, the answer to the sum is 4,355,357. Long tots in money may be constructed on the same principles, but, of course, in each pair of lines the sum of the farthings (if any) must be a penny; and the sum of the pence, together with the penny carried from the farthings (if any), must amount to a shilling; and the sum of the shillings must be 19, so that with the shilling carried it will make £1. Finally, each pair of digits in the pounds columns must amount to 9.

(2.) *Exercises which lead to ease in subtraction.*—This can be gained only by regarding subtraction as complementary addition. Practical exercises on calculating the change to be received when making purchases are among the most useful in this direction.

(3.) *Exercises on calculating prices.*—These depend on the fact that there are a *dozen* pence in a shilling, *twenty* shillings in a pound or hundredweights in a ton, and articles in a score. As a rule, teachers limit this useful practice to cases in which there is an exact number of dozen, etc. It should be extended to cases in which the number is near an exact number of dozen, etc. For instance, the children should be taught to regard 73 as 6 dozen and 1; so 245 articles at 3d. each should be treated as 240 at 3d. + 5 at 3d. Since 240d. = £1, the price of 240 articles at 3d. each is £3. To this we add the cost of 5 at 3d.—namely, 1s. 3d., and we have the total, £3, 1s. 3d.

(4.) *Easy cases of percentages.*—Percentages should be converted into vulgar fractions, or so much in the pound, and *vice versa*.

(5.) *Exercises on the mensuration of rectangular surfaces and solids.*—These have a bearing on the future work of so many of the pupils, especially of the boys, that they ought to receive a great deal of attention.

In the curriculum of the elementary school "elementary mathematics" means practically the same as arithmetic; and although we might single out the solution of equations as a very useful part of algebra, yet if the elements of algebra are taught in elementary schools, it should be on account of the mental training they afford rather than of their practical utility. Geometry is of much more practical value, and taken in connection with geometrical drawing affords great scope for practical work; in fact, the properties of some of the simpler geometrical figures, plane and solid, are dealt with in the kindergarten.

With these few notes the student should now be able to draw up a syllabus.

2. What practical work, other than the working of sums, would you recommend to be done in connection with arithmetic by children from seven to ten years of age? Discuss the question of the use of one or more kinds of apparatus in the elementary stages.

At this period children have been taught to count, and can say off odd or even numbers as required. The practice of counting by threes, fours, fives, etc., is a very useful one, and affords a good means of filling in odd minutes—for example, on assembly, while waiting for time to mark registers, or after closing registers, if the next lesson is not quite ready to begin. One special form of this way of counting is the multiplication table, for which constant repetition is necessary—see the justification in the text-book. It may, of course, be argued that this is not "practical work;" but it should be begun with the use of the ball-frame, which will enable the children to visualise the quantities they are dealing with.

When the class is not too large, exercises in measuring and weighing should be given. This practical work should be associated with calculations, as one helps the other. Demonstrations on the relation between the area of a rectangle and the length of its sides should be given; then the areas of all available rectangles—slates, sheets of paper, books, and blackboards—should be found from actual measurement. This should be followed by showing that the number of square units in the area of a triangle is half the product of the numbers of linear units in the base and perpendicular height. Three cases are necessary in dealing with this: (*a*) a right-angled triangle, which is evidently half the rectangle, with the same base and height; (*b*) an acute-angled triangle, which is the sum of the two right-angled triangles, having the perpendicular and segments of the base as their sides; and (*c*) the obtuse-angled triangle, which is the difference of two right-angled triangles similarly formed. These exercises may be taken in connection with the question on practical work in mathematics given above.

English Literature.

For general reading take the first book of the *Golden Treasury*. This deals with Elizabethan poetry down to the death of Shakespeare. The chief characteristics of the lyrical poetry of this period are its freedom of style and its fondness for conceits.

Prepare in detail *Paradise Lost*, Book I., 1–220. Every passage containing any peculiarity of phrasing or expressing any specially striking thought should be set down in the note-book and committed to memory.

1–16. Paraphrase this passage, or write it in prose order, beginning with the invocation,—

"Sing, Heavenly Muse."

It was usual for the writer of an epic poem to begin by an invocation to the Muses to assist him in his work. Both the *Iliad* and *Odyssey* of Homer begin in this way; and although Virgil begins the *Æneid* with the words, "*Arma virumque cano*"—"I sing of arms and the man"—yet after seven lines he breaks off, and says, "*Musa, mihi, causas memora*"—"O Muse, bring these matters to my mind." The Muses of classical poetry were supposed to abide on Mount Helicon in Aonia, a part of Bœotia in Greece—hence spoken of as the "Aonian mount." But Milton intends his poem to be something grander still, and so he invokes the help of the "Heavenly Muse," or that Divine inspiration which enabled Moses to tell the Israelites, "In the beginning how the heavens and earth rose out of chaos."

2. *Forbidden tree.* Read the account of the Fall in Genesis.

7. *Oreb*, also spelt Horeb. This is the same as Sinai, and is the mountain in the Sinai peninsula where the law was given to Moses, and where God revealed Himself to Elijah (1 Kings xix. 8).

11. *Siloa's brook*, the stream running from the "pool of Siloam," near the Temple at Jerusalem.

22. *Pregnant*, ready to bring forth.

24. *Highth.* Notice that Milton forms this abstract noun regularly by the simple addition of "th" to the adjective.

32. *For one restraint*, except for one matter in which they were restrained.

36. *What time*, at the time that. Compare Job vi. 17: "What time they wax warm, they vanish: when it is hot, they are consumed out of their place."

39. *His peers*, his equals (Lat. *par*, equal).

48. *Adamantine chains.* Adamantine is from a Greek word meaning that which cannot be conquered or subdued. It was applied to hard steel, and to the diamond, which name is a doublet with *adamant*.

56. *Baleful*, destructive, full of evil.

63. *Darkness visible.* The figure of speech formed by the union of two terms which are apparently contradictory is called oxymoron. Other examples are—"King James was the wisest fool in Christendom;" "The clerk was conspicuous by his absence."

77. *Weltering*, rolling. Compare *Lycidas*, 12–14,—

> "He must not float upon his watery bier
> Unwept, and welter to the parching wind
> Without the meed of some melodious tear."

81. *Beelzebub*, originally the name of one of the gods of the Philistines. It means the "god of flies," hence applied to one of the chief demons. See Luke xi. 15. In Book II., Milton says he stood "with Atlantean shoulders fit to bear the weight of mightiest monarchies."

82. *Satan.* This is a Hebrew word meaning "enemy."

104. *Dubious battle*, a battle in which the result was for a while "doubtful," or hung in the balance.

117. *Empyreal*, made of fire. According to Ptolemy, the highest of the five heavens was made of pure fire; hence we have the term empyrean for the heaven of heavens.

124. *Tyranny*, absolute government. It did not originally imply harsh government.

125. *Apostate*, one who stands apart, or who has separated himself from the main body.

129. *Seraphim*, angels distinguished by their ardent zeal. The name comes from a Hebrew word meaning to burn (see Isa. vi. 2).

138. *Essences*, beings, spirits. The alchemists used the name for liquids distilled from other bodies. They thought that by distillation they could obtain the very being of the substance (Lat. *esse*, to be).

139. *The mind and spirit remains.* If we consider mind and spirit to denote two different things, then the use of the singular verb is a grammatical error; but we can justify it if we assume mind and spirit to be synonymous.

173. *Precipice* (from *præ*, before; and *caput*, the head), a place down which one may fall head foremost.

185. *Rest.* The first word rest is a verb = let us rest, co-ordinate with "let us tend."

187. *Offend*, literally to dash against or strike. Compare to take the offensive in the war.

195. *Prone*, lying face downward. It is opposed to *supine*, which means lying on the back.

199. *Briareös*, a giant described by Homer as having fifty heads and a hundred hands. *Typhon*, another monster mentioned by Homer.

201. *Leviathan.* It is not clear whether leviathan in the Bible refers to the whale or to the crocodile. Milton here uses it to denote the greatest creature in actual existence.

207. *Under the lee*, the side of him which offers protection from the wind.

214. *Reiterated*, repeated.

English History.

Continue the work to the restoration of Charles the Second. The details of the civil war are generally well known, although the different incidents are generally taken without much regard for their mutual connection. Thus many can write an account of the battle of Newbury, but few can narrate the movements which led to the two armies meeting at that spot. This should be attended to, and the movements of troops followed out with the atlas, preferably an atlas of English history, such as Reich's (Macmillan).

The foreign affairs require attention. The common danger which united Holland and England in the time of Elizabeth had come to an end with the decline in the power of Spain, and the two countries found themselves in violent commercial rivalry. The Dutch ships were splendidly built, and seemed likely to acquire a monopoly of the carrying trade of the world. To deal with this the English Parliament in 1651 passed the Navigation Act, which forbade the importation into this country of any goods brought in foreign ships, unless those ships belonged to the country that produced the goods This unreasonable Act led to a war with Holland, in which several naval battles took place. The Dutch were commanded by Van Tromp, and the English by Blake, who, in spite of the fact that he had never been to sea before he was fifty, gained several victories over the Dutch. In this war the Dutch fleet was engaged in escorting convoys of merchantmen up and down the English Channel. This was a disadvantage to them; but, on the other hand, they had a great advantage when the contest took place on the shallow water near the coast of Holland, which was very familiar to them, and in which the deep English ships were constantly running aground. In 1652 there was much fighting in the attempt to capture Dutch merchantmen in the English Channel, and to capture the Dutch herring fleet off the north coast of Scotland. In each case the Dutch offered a very stubborn resistance. On September 28 of that year Blake defeated De Witt off the Kentish Knock, about twenty miles north-east of the North Foreland, but was defeated by Van Tromp off Dungeness on November 29. In February of 1653, Van Tromp successfully convoyed a large number of ships laden with wine from Bordeaux to Holland, in spite of determined attacks by Blake. In the following June, Monk defeated Van Tromp and De Ruyter in a running fight in the North Sea, ending near Ostend. In July, Monk defeated Van Tromp in a battle off the Texel. Van Tromp was killed in the action, but the English fleet suffered considerably; and although at first the English Parliament made some extravagant demands, a peace satisfactory to both sides was soon concluded.

Cromwell formed an alliance with France, and English and French troops gained a victory over the Spaniards at the battle of the Dunes. When peace was concluded, Dunkirk was secured to England, as was also Jamaica, which had been captured by Admirals Penn and Venables.

A special study should be made of the life of Oliver Cromwell; the account of Cromwell in Macmillan's *Twelve English Statesmen* is especially recommended.

Geography.

Study the geography of France. Work out carefully the "build" of the country, note the mountains in the east and on the borders, the table-land of Auvergne in the centre, and the plain in the west (Landes, and valley of Loire) and in the north (valley of the Seine).

The rivers are very important as a means of internal communication, and the canals are also of great importance. Notice (1) the connection of the Seine and Loire with the Rhine, and consider the trade between France and the Rhenish provinces; (2) the connections between the Rhine, Rhone, and Garonne.

As regards climate, France has all the advantages of a westerly maritime situation, combined with a more southerly latitude than England; hence the agricultural products are both abundant and valuable. The Riviera has quite warm weather in winter, but the high ground in the north-east suffers extremes of heat and cold.

The productions vary in different zones. Thus there are:—

(1.) The vine zone, east and north of the Landes. Claret and Sauterne are produced near the Garonne, Bordeaux being the centre. Burgundy, including Beaune, Chablis, and other red and white wines, are produced in the province of that name: centres, Maçon, Dijon. Champagne is produced in that province: centres, Rheims, Epernay, and Ay. Brandy is distilled from wine and grapes in Charente and Champagne. Cognac is especially noted. Flax, hemp, and poppies are grown in the same region.

(2.) The zone of pastures—Normandy and Brittany, famous for butter, cheese, eggs, poultry, and honey. About twelve or twenty years ago Normandy and Brittany butters were imported into England in very large quantities; now the co-operative creameries of Denmark are driving them from the field. Fruit, especially apples, pears, and plums, are produced in very large quantities.

(3.) The zone of grains and fruits, where corn, beetroot (for sugar), and orchard fruits are produced.

Notice the occupations of the people—agriculture, manufactures, and trade. A very large proportion of the people aim at getting a government appointment of some sort.

Study the chief ports in relation to the hinterland they serve, noting the exports, and the raw materials imported, and how they are conveyed to their destinations.

Arithmetic.

Take chap. xliv., read it carefully, and work the examples at the end. It will be noticed that in this chapter each question is confined to the treatment of one kind of stock. Transfers from one stock to another are reserved for the next chapter.

Algebra.

The first chapter on equations. Work as many examples as time will allow.

Geometry.

Study the geometry of the cube and other rectangular solids, and work the examples given in chap. xlix. of Christian and Collar's *New Arithmetic*. There is nothing like numerical calculations for ensuring a thorough knowledge of principles.

Elementary Science.

Do as much as possible this month at the part of the syllabus dealing with composition of matter.

Bodies are classified as elements or compounds; but we must beware of saying, as is often done, that elements are bodies which cannot be split up into anything simpler. The name is quite a provisional one. All we are justified in saying is that the bodies which we call elements *have not hitherto* been decomposed into simpler bodies. Some time ago caustic soda was regarded as an element, but Sir Humphry Davy succeeded in obtaining the metal sodium from it; and there seems reason to believe that all the bodies that we now call elements may some day be proved to be composed of one and the same fundamental constituent, differently arranged in the different so-called elements, or that the different elements are different forms of the same fundamental substance, just as water, ice, and steam are three different forms of the same substance.

The syllabus includes the study of some of the more common elements and compounds. Of the elements given, some are metals, and some are non-metals. The former are distinguished by their physical properties of malleability and ductility, as well as by their metallic lustre. They are also good conductors of heat and of electricity. Heat readily passes through an iron or copper kettle, and warms the water contained in it; but it passes much less readily through a non-metallic substance. Take a kettle that has been used on an open fire for some time, and has become covered with a thick coat of soot. Fill this with boiling water, and stand it on the palm of your open hand. It hardly feels warm. This is because the soot, which is almost pure carbon, does not allow the heat to pass from the hot water to the hand. You could not do this with a *clean* kettle, because the heat will pass quickly through the metal to your hand. The metals, too, are better conductors of electricity than the non-metals; and a still more marked character is that the conductivity of a metal becomes less as the temperature rises, while the conductivity of a non-metal improves with a rise of temperature. An interesting application of this is seen in the use of carbon filaments in the manufacture of electric lamps. A thin platinum wire is easily heated on sending a current through it, and it soon becomes white-hot and gives out light; but much more energy is needed to send the current through the heated wire than through the cold wire. On the other hand, as the temperature of a carbon thread rises, the current passes through more and more easily, and thus there is a saving in the amount of electricity used.

The study of the chemical elements and their compounds cannot be effective unless it is systematic. Note first the occurrence of the body in nature, whether free or combined. The study of the methods of preparation, comparing the preparation of one body with that of another, and noting what properties of that body or of other bodies enable the preparation to be carried out in that way.

Next observe the properties of the body, its resemblances to other bodies, and particularly those properties which serve as a test for its presence. Finally, note its chief compounds. Comparison is the essential point in this study.

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MATHEMATICS.

(STAGES 2 AND 3.)

BY FRANK CASTLE, M.I.M.E.,

Royal College of Science; Lecturer on Mathematics, etc., Morley College; Author of "Elementary Practical Physics," "Practical Mathematics," etc.

Measurement of Angles.—The magnitude of an angle may be estimated either by the number of degrees or the number of radians it contains. Thus, if the circumference of a circle be divided into 360 equal parts, then an angle of 1 degree—written 1°—is obtained by joining two consecutive points on the circle to the centre.

In *radian measure* (or what is sometimes called circular measure) the angle subtended at the centre by the arc enclosed by any two lines drawn from the centre to the circumference is measured by the ratio of length of arc to the radius of the circle—or, briefly, angle = arc ÷ radius. The angle is unity when the length of arc is equal to the radius.

If the length of arc be a semicircle of radius r, then angle $= \pi r \div r = \pi$; but this is also 180°. Hence if R denote the number of radians in an angle, and D the number of degrees in the same angle, the relation between D and R is given by

$$\frac{D}{180} = \frac{R}{\pi}.$$

Hence the number of degrees in unit angle, that is, when R = 1, may be obtained from $D = \frac{180}{\pi} = 57{\cdot}2958$ degrees. Conversely, if D denotes the number of degrees in a given angle, then the number of radians in the same angle is given by

$$R = \frac{D \times \pi}{180}.$$

A degree is assumed to be divided into 60 equal parts, each called a *minute*; and a minute into 60 equal parts, each called a *second*. Hence the fractional part of a degree may be expressed either as the decimal of a degree or in minutes and seconds. Thus 0·2958 degrees may be written as 17 minutes, and 44·9 seconds—that is, 57·2958 degrees may be written as 57° 17′ 44·9″.

Trigonometrical Ratios.—Another and important method of estimating the magnitude of an angle is by means of the so-called trigonometrical ratios—that is, the sine, cosine, and tangent, together with the cosecant, secant, and cotangent of an angle. These are fully explained in all the books on the subject. It is only necessary, therefore, here to draw attention to the more important sections, and this may be effected by typical examples as follows:—

Ex. 1. (*a*) What is meant by the radian or circular measure of angles, and what is the unit of circular measure?

(*b*) Given an angle in radians, how is its value found in degrees?

(*c*) An angle is $\frac{2}{3}$ in radian measure; find the number of degrees, minutes, and seconds in the angle.

(*c*) Let D denote the number of degrees in the angle. Then

$$D = \frac{2}{3} \times \frac{180}{\pi} = \frac{120}{\pi}.$$

$$\therefore D = 376{\cdot}992 \text{ degrees} = 376° 59′ 31{\cdot}2″.$$

Ex. 2. (*a*) Define a degree and a minute of angle; also define a radian (or the unit of circular measure).

(*b*) Given that π is equal to 3·141593, find the number of degrees with the odd minutes and seconds in an angle of 5 radians, and show the angle in a diagram. (1902.)

(*b*)
$$D = \frac{180}{\pi} \times 5 = \frac{900}{\pi}$$
$$= 286{\cdot}4789 \text{ degrees} = 286° 28′ 44″.$$

Ex. 3. (*a*) The ratio of two geometrical magnitudes is commonly denoted by the letter π. State what these magnitudes are.

Without going into much detail, indicate why you believe that π is nearly equal to 3·14159.

(*b*) Find the number of degrees, with the odd minutes and seconds, in the angle subtended at the centre of a circle by an arc twice as long as the radius. (1905.)

(*b*)
$$\text{Angle in radian measure} = \frac{\text{arc}}{\text{radius}} = 2.$$
$$\text{Number of degrees} = \frac{180}{\pi} \times 2 = \frac{360}{\pi}$$
$$= 114° 35′ 30″.$$

Ex. 4. (*a*) Find, with the aid of an appropriate diagram, the sine, cosine, and tangent of an angle of 30°, and also of an angle of 60°.

(*b*) Write down with proper signs the numerical values of sin 120°, cos 150°, tan 150°. (1905.)

(*a*) If ABC is an equilateral triangle, each side 2 units length, then a perpendicular AD on the base BC will divide the angle at A into two equal parts, each 30°.

As AB = 2, BD = 1, and $AD = \sqrt{3}$.

$$\sin 30° = \frac{BD}{AB} = \frac{1}{2}.$$

$$\cos 30° = \frac{AD}{AB} = \frac{\sqrt{3}}{2}.$$

$$\tan 30° = \frac{\sin 30°}{\cos 30°} = \frac{1}{2} \div \frac{\sqrt{3}}{2} = \frac{1}{\sqrt{3}};$$

or, more simply,

$$\tan 30° = \frac{BD}{AD} = \frac{1}{\sqrt{3}}.$$

(*b*) $\sin 120° = \sin (180° - 120°) = \sin 60° = \cos 30° = \frac{\sqrt{3}}{2}$.

$\cos 150° = -\cos (180° - 150°) = -\cos 30° = -\frac{\sqrt{3}}{2}$.

$\tan 150° = -\tan (180° - 150°) = -\tan 30° = -\frac{1}{\sqrt{3}}$.

Ex. 5. (*a*) Draw an appropriate diagram, and from it find the numerical values of the sine, cosine, and tangent of an angle of 45°.

(*b*) If A be any angle between 0° and 90°, find tan A in terms of sin A, and also in terms of cos A. (1906.)

(*b*)
$$\tan A = \frac{\sin A}{\cos A} = \frac{\sin A}{\sqrt{1 - \sin^2 A}}$$
$$= \frac{\sqrt{1 - \cos^2 A}}{\cos A}.$$

Ex. 6. (*a*) Explain the method of measuring angles in radians (or in circular measure), and express an angle of 36° 15′ 12″ as the decimal of a radian correct to five places.

(*b*) The distance between successive graduations on the outer rim of a graduated circle is one-fiftieth of an inch, and this interval subtends an angle of one minute at the centre of the circle; find the diameter of the circle to the nearest hundredth of an inch. (1899.)

Ans. (*a*) 0·63274; (*b*) 137·51.

Ex. 7. (*a*) Express the angle 249° 35′ 42″ in degrees, and the decimal of a degree, and find by logarithms as accurately as you

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can, with the given value of log. π, the measure of the angle in radians (or units of circular measure).

(*b*) The circumference of a circle is 4×10^7 metres. Find in metres the diameter of the circle as accurately as the logarithms given in the table allow. [Log. $\pi = 0{\cdot}4971499$.] (1902.)

Ans. (*a*) 249·595°, 4·356254; (*b*) 12732396.

Ex. 8. Find the sine, cosine, and tangent of an angle of 30°.

One of the angles of a triangle is such that its cosine is $-\frac{1}{\sqrt{2}}$. Show how to construct this angle, and find its sine and tangent.

Trace the changes, in sign and magnitude, of tan A as A changes from 0 to four right angles. (1901.)

Ex. 9. Given that the sine of 24° is 0·4067, and that the cosine of 24° is 0·9135, write down the sine and cosine of 156°, of 204°, and of 336°; also write down the sine and cosine of 114°, and find to three places of decimals the tangent of 114°. (1902.)

Ans. 0·4067; − 0·9135; − 0·4067; − 0·9135; 0·4067; 0·9135; 2·246.

Ex. 10. (*a*) Define the sine, cosine, and tangent of an angle less than a right angle.

(*b*) Find the sine, cosine, and tangent of an angle of 30°.

(*c*) Write down the values of sin 150°, cos 150°, tan 210°, sin 330°, cos 330°, and indicate with the aid of diagrams the reasons for the values written down. (1898.)

Ex. 11. (*a*) Show in a carefully-drawn diagram an angle of 234°, and explain with reference to your diagram why both the sine and the cosine of that angle are negative.

(*b*) Assuming that sin 36° 56′ is 0·6, and that cos 36° 56′ is 0·8, find the angle whose sine is − 0·6, and whose cosine is − 0·8.

(*c*) Find from the table the numerical value of sin 326° 42′. (1906.)

Ans. (*b*) The angle whose sine is − 0·6 is 180° + 36° 56′ = 216° 56′. The angle whose cosine is − 0·8 is 180° − 36° 56′ = 143° 4′.

Ex. 12. Having given that the cosine of 27° is 0·891, write down the cosine of 153°, of 207°, and of 333°; also write down the sine of 117° and of 243°, and find to three places of decimals the sine of 153°. (1902.)

Ans. − 0·891; − 0·891; 0·891; 0·891; − 0·891; 0·445.

NOTES ON PHYSICS.

BY EDWIN EDSER, A.R.C.SC.,

Author of "Heat for Advanced Students," "Light for Students," "Differential and Integral Calculus for Beginners," etc.

General Physics.

Use of Moments of Inertia in Mechanical Problems.—In previous articles of this series methods of determining the moments of inertia of certain symmetrical bodies were explained. Some mechanical problems which can only be solved when the moment of inertia of a body is known will now be dealt with. The general principle used in their solution is as follows:—

If a body is moving bodily in space, and at the same time rotating about an axis which moves with the body, then the total kinetic energy of the body is equal to one-half of its mass m multiplied by the square of its linear velocity v, *plus* one-half of the moment of inertia mK^2 of the body about its axis of rotation multiplied by the square of its angular velocity ω; or, in symbols,

$$\text{total kinetic energy} = \tfrac{1}{2}mv^2 + \tfrac{1}{2}mK^2\omega^2.$$

K is, of course, the so-called radius of gyration of the body about the given axis of rotation. If I is the moment of inertia of the body of mass m about the given axis, then

$$mK^2 = I.$$

A cylinder rolls from rest down an inclined plane, without slipping; determine its acceleration, and the distance traversed in a given time.

As the body rolls down the inclined plane it descends toward the earth. To solve the above problem we may equate the work done by gravity to the kinetic energy acquired by the body during its descent.

Let the plane be inclined at an angle θ to the horizon. At any instant let the cylinder be moving parallel to the plane with a linear velocity v; then, if it continued moving with this linear velocity, its angular velocity would be constant and equal to $\frac{v}{r}$, where r is the radius of the cylinder. For the cylinder rolls without slipping, and therefore every time that it completes one rotation its centre advances parallel to the plane through a distance $2\pi r$. Therefore in one second, while its centre advances through a distance v, the number of rotations made will be $v/2\pi r$, and in each rotation a radius of the cylinder sweeps out an angle of 2π radians. Hence angular velocity

$$= \frac{v}{2\pi r} \times 2\pi = \frac{v}{r}.$$

In the problem under consideration the linear velocity is constantly increasing, and therefore the angular velocity is increasing. If the linear velocity is equal to v at any instant, then at that instant the angular velocity ω is equal to v/r. The kinetic energy of the cylinder is thus equal to

$$\tfrac{1}{2}mv^2 + \tfrac{1}{2}mK^2\omega^2 = \tfrac{1}{2}mv^2 + \tfrac{1}{2}mK^2\left(\frac{v}{r}\right)^2$$

$$= \tfrac{1}{2}m\left(1 + \frac{K^2}{r^2}\right)v^2.$$

The velocity increases uniformly with the time, so that between the instant when the cylinder starts from rest and that when it acquires the linear velocity v the average velocity is equal to $v/2$. Let the time between the two instants just mentioned be equal to t. Then the cylinder has moved parallel to the plane through a distance $(v/2) \times t$, and has descended toward the earth through a distance

$$\frac{vt}{2}\sin\theta.$$

Hence the work done by gravity

$$= \frac{mgvt\sin\theta}{2},$$

where g is the force exerted by gravity on unit mass.

Equating the work done by gravity to the kinetic energy acquired by the cylinder, we have

$$\tfrac{1}{2}m\left(1 + \frac{K^2}{r^2}\right)v^2 = \tfrac{1}{2}mgvt\sin\theta.$$

$$\therefore v = \frac{g\sin\theta}{1 + \frac{K^2}{r^2}} \cdot t \quad \ldots\ldots\ldots \quad (1)$$

It is easily proved that if a body slides down the same plane without being retarded by friction, then its velocity at t seconds after starting from rest is equal to

$$v = g\sin\theta \,.\, t.$$

Consequently, when a body rolls down an inclined plane its velocity at any instant is smaller than if it had slidden down without friction. The reason for this is obvious from the above. If the body rolls, its kinetic energy is partly due to its linear velocity, and partly due to its angular velocity, and therefore when it has descended for a given time its linear velocity is less than it would have been had there been no angular velocity. Thus, if a coach is going downhill when one of its wheels comes off, then, if the coach does not upset, it will reach the bottom of the hill before the wheel—that is, supposing friction to be absent.

Let a thin-walled hollow cylinder roll down an inclined plane; then in this case $I = mr^2$, and therefore $K^2 = r^2$. Thus

$$v = \frac{g\sin\theta}{1 + \frac{1}{1}}t = \frac{1}{2}g\sin\theta\, t$$

—that is, the velocity at any instant is only half as great as that of a body which slides down the plane without friction.

In the case of a solid cylinder, $I = m\frac{r^2}{2}$, and therefore $K^2 = \frac{r^2}{2}$. In this case

$$v = \frac{g\sin\theta}{1 + \frac{1}{2}}t = \frac{2}{3}g\sin\theta \,.\, t,$$

so that its velocity is two-thirds of that of a body which slides down the plane.

In the case of a solid sphere, $I = m \,.\, \frac{2}{5}r^2$, so that $K^2 = \frac{2}{5}r^2$. In this case

$$v = \frac{g\sin\theta}{1 + \frac{2}{5}}t = \frac{5}{7}g\sin\theta \,.\, t,$$

so that its velocity is five-sevenths of that of a body which slides down the plane.

Returning to the general case, equation (1) shows that the velocity is proportional to the time, and therefore the acceleration (rate of increase of velocity) parallel to the plane is obtained by dividing v by t, when we obtain

$$\text{acceleration parallel to plane} = \frac{g\sin\theta}{1 + \frac{K^2}{r^2}}.$$

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The distance parallel to the plane traversed in time t is found by halving the right-hand side of (1), in order to obtain the average velocity, and multiplying the result by t, when we obtain

$$\text{distance traversed} = \frac{1}{2} \cdot \frac{g \sin \theta}{1 + \frac{K^2}{r^2}} \cdot t^2.$$

A nut descends from rest along a vertical screw. Find the acceleration of the nut, and the distance traversed in a given time, supposing friction to be absent.

Let the screw have n threads per unit length. Then while the nut descends through unit length it must make n rotations about the axis of the screw, and therefore, when the nut is descending with a linear velocity v, it must be turning about the axis of the screw at a rate of nv turns per second, its angular velocity ω being thus equal to $2\pi nv$ radians per second. Thus its kinetic energy

$$= \tfrac{1}{2}mv^2 + \tfrac{1}{2}mK^2 \cdot (2\pi nv)^2 = \tfrac{1}{2}m(1 + (2\pi nK)^2)v^2.$$

Here m is the mass of the nut, and mK^2 is its moment of inertia about an axis coinciding with the axis of the screw. The nut descends from rest with uniformly increasing velocity; therefore if it acquires the linear velocity v in t seconds, its average velocity during this time must have been $v/2$, and the distance through which it has descended is $vt/2$. Gravity has acted through this distance, doing $mg \times (vt/2)$ units of work.

Hence $\tfrac{1}{2}m(1 + (2\pi nK)^2)v^2 = \tfrac{1}{2}mgvt.$

$$\therefore\ v = \frac{g}{1 + (2\pi nK)^2} \cdot t,$$

$$\text{acceleration} = \frac{v}{t} = \frac{g}{1 + (2\pi nK)^2}.$$

Thus the greater the value of K, and the greater the value of n, the smaller will be the acceleration. Distance traversed in t seconds

$$= \frac{1}{2} \frac{g}{1 + (2\pi nK)^2} \cdot t^2.$$

Heat.

Students' apparatus for determining the coefficient of expansion of a gas at constant pressure.

In determining the coefficient of cubical expansion of a substance it is generally necessary to know the volume of the substance at some stated temperature, and to observe the increase in volume produced by a given rise of temperature. If the substance is a gas, it is also necessary to keep it at a constant pressure, for any alteration of pressure will itself produce an alteration of volume independently of any change of temperature which occurs. Further, temperatures can be more accurately measured by a gas thermometer than by a mercury thermometer; for irregularities in the expansion of the containing vessel will be of far less importance when the contained substance is a gas than they would be if the contained substance were a liquid such as mercury, since the expansion of a given volume of gas at constant pressure, produced by a given rise of temperature, is roughly ten times as great as the expansion of an equal volume of liquid produced by the same rise of temperature. Hence a mercury thermometer should not be used in the experiment under consideration.

The measurement of temperature by means of a constant pressure gas thermometer is effected on the following lines. Let V be the volume of the gas at a given pressure and at a temperature of 0° C. (the temperature of melting ice). Let the pressure of the gas be maintained constant, while the temperature of the gas is raised to 100° C. (the temperature at which water boils under standard barometric pressure—that is, 760 mm. of mercury), and let the consequent increase of volume of the gas be v. Then when the volume of the gas is equal to $V + v$, the temperature of the gas is by definition 100° C. When the volume of the gas is $\left(V + \frac{v}{2}\right)$, the temperature of the gas will be 50° C. In general, if the volume of the gas is $\left(V + \frac{n}{100}v\right)$, the temperature of the gas is by definition n° C.

Hence it follows that v is the increase in volume of a quantity of gas which occupies a volume V at 0° C, due to a rise of temperature from 0° C. to 100° C.—that is, through 100° C.

The coefficient of expansion of a gas at constant pressure is defined as the increase in volume of a given quantity of gas produced by a given rise of temperature, divided by the volume of the gas at 0° C. and the rise of temperature. Hence, if V and v are measured as explained above, then a, the coefficient of expansion of the gas at constant pressure, is given by

$$a = \frac{v}{V \times 100}.$$

Thus, in order to determine a, we must keep the pressure of a given quantity of gas constant, measure its volume V at the temperature of melting ice, and measure the increase in volume which is produced when the temperature is raised to 100° C., the boiling-point of water.

I have found the apparatus which I am about to describe to be most satisfactory for this purpose. It has been designed so that a student can complete the determination of the coefficient of expansion of a gas in about an hour or an hour and a half, any gas being used; further, it is most important that the gas should be thoroughly dried and freed from impurities (such as moisture and carbon dioxide if air is used), and therefore the apparatus has been arranged so that the student can effect this purification. No mercury thermometer is used in the experiment.

The apparatus* is shown diagrammatically in Fig. 1. Dried

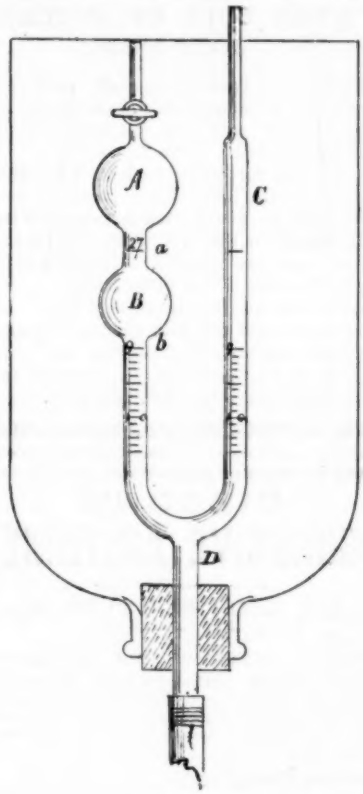

FIG. 1.

and purified air is enclosed at 0° C. and atmospheric pressure, in a glass bulb, A, of exactly 27 c.cs. capacity between the stop-cock above and the graduation a below. Below the bulb A is another, B, of exactly 9 c.cs. capacity between the graduation a and b; one and a half c.cs. of the tube below b are graduated in c.cs. The two bulbs and the tube below them form one limb of a U-tube, the other limb, C, being open above to the atmosphere. The tube D is connected by means of a piece of thick walled rubber-tubing with a reservoir of mercury, and by raising or lowering this, mercury can be introduced into or removed from the limbs of the glass U-tube. When the mercury surfaces in the two limbs of the U-tube are in the same horizontal plane, the air enclosed in the bulb A will be at atmospheric pressure. Opposite to the graduations a, b, and those below b, there are similar graduations on the other limb of the U-tube, so that the mercury can be adjusted to stand at the same level in both. Hence, as the enclosed gas is heated up to 100° C., the mercury reservoir is lowered so that the mercury surfaces in the two limbs of the U-tube remain in the same horizontal plane.

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The increase in the volume of the gas is then read off from the position of the mercury surface below *b*.

Lubricant.—An important point in connection with this and similar apparatus is to have for the stop-cock a lubricant which will not become too thin at 100° C. For this purpose the ordinary lubricants, such as vaseline and resin stearate, are quite unsuited. I have found, however, that if a piece of black or white rubber-tubing (red rubber is unsuitable) is burnt in a flame, and some of the sticky residue is used to lubricate the stop-cock, no trouble will be experienced at any ordinary temperatures.

Method of carrying out an Experiment.—The stop-cock is opened, and the bulb A is connected by means of a piece of rubber-tubing with a drying and purifying tube containing fused calcium chloride (to absorb moisture), and soda-lime (to absorb carbon dioxide). The mercury reservoir is lowered till the mercury stands just above the bend in the U-tube, and air is pumped through the drying tube and the bulbs by means of a bicycle pump. This process should be carried out thoroughly, for carbon dioxide or moisture in the air will cause the final results to be inaccurate.

The U-tube is surrounded by a glass vessel open above. While the stop-cock is still open and the drying tube is attached to it, but with the pump removed, fill the vessel surrounding the U-tube with ice and water; stir this well, and after some minutes raise the mercury reservoir till the mercury surface coincides with the graduation *a*. If the mercury in the other limb of the tube does not coincide with the graduation opposite to *a*, the stand supporting the apparatus must be levelled, by means of the screws provided, till it does so. The stop-cock is now closed. Thus 27 c.cs. of pure and dry air have been enclosed at a temperature of 0° and at atmospheric pressure, so that V = 27 c.cs.

Now remove the ice and water from the surrounding vessel, and fill the latter three parts full with boiling water. Introduce steam into the water by means of an open tube connected to a vessel (such as an oil can) in which water is kept boiling. When the bubbles of steam rise through the water without collapsing, the water is at its boiling-point (100° C. if the barometric pressure is 760 mm. of mercury; for any other barometric pressure the boiling-point can be determined from tables). Now lower the mercury reservoir till the mercury surfaces in the two limbs of the U-tube coincide with corresponding graduations, which determines that they are in the same horizontal plane, and therefore that the air enclosed in the bulbs is at atmospheric pressure. Read off the increase *v* in the volume from the position of the mercury surface with respect to the scale beneath *b*. The value of the coefficient of expansion can now be calculated from the formula already given.

Correction for the Expansion of the Bulbs, etc.—The correctness of the volume graduations can be tested by removing the U tube, inverting it, and filling the limb comprising the bulbs with water. The water between any pair of graduations is then run out into a weighed flask, and weighed. If the graduations are correct there is yet another source of error—namely, the expansion of the bulbs, etc. The volume V of gas enclosed at 0° is known accurately; at 100° C. the volume of the gas is apparently V + *v*, but owing to the expansion of the bulbs the true volume is (V + *v*) (1 + 100*g*), where *g* is the coefficient of cubical expansion of the glass (about 0·000025). Hence *true increase* of volume = 100*g*V + (1 + 100*g*)*v*. Therefore coefficient of expansion of gas

$$= \frac{100gV + (1 + 100g)v}{100V}$$

$$= g + \frac{(1 + 100g)v}{100V}.$$

Note that, theoretically, the final result is *not* obtained by adding the coefficient of expansion of the glass to the coefficient of apparent expansion of the gas in glass; although with the apparatus described, where *v* can scarcely be measured with an error less than 1 per cent., (1 + 100*g*) will be less than 1 per cent. greater than 1, so that there is no use in applying this refinement, and the final result may be taken as

$$g + \frac{v}{100V}.$$

The alterations in procedure when a gas other than air is used will readily suggest themselves. The gas must be introduced through a drying and purifying tube, as in the case of air.

Students' apparatus for determining the pressure coefficient of a gas.

To determine the pressure coefficient of a gas we must enclose a quantity of the gas at a temperature of 0° C., and at a known pressure P, and measure the increase in pressure *p*, which suffices to maintain the volume constant when the temperature is raised to 100°.

Then pressure coefficient = $\frac{p}{100P}$.

The apparatus * for carrying out these operations is represented in Fig. 2. The glass bulb A is filled, down to the mark

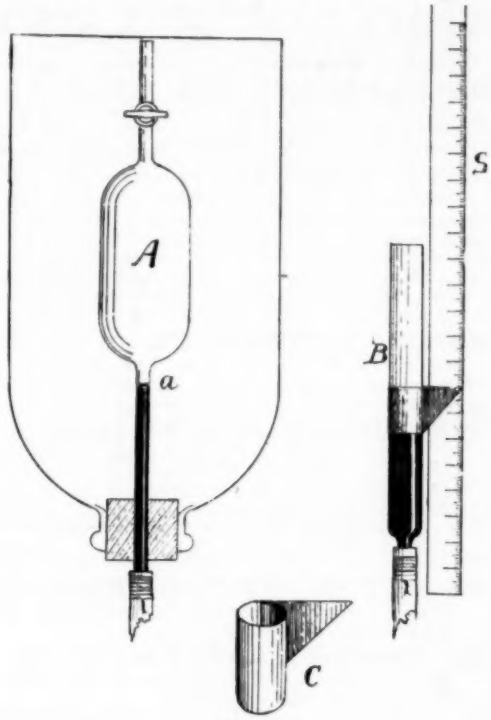

FIG. 2.

a below the bulb, with pure dry air at 0° C. The tube below *a* is connected by means of a rubber tube with the mercury reservoir B. The position of the mercury surface in B with respect to the scale S is measured by means of a sliding index shown separately at C. This consists of a strip of copper foil with a straight edge, wrapped round the glass tube B so that the upper edge forms a circle in a plane, a tag being left projecting so that it overlaps the scale. This slider is adjusted so that the surface of the mercury can just *not* be seen by an eye in the plane of its upper surface, and the graduation of the scale which coincides with the upper surface of the tag is observed.

Method of carrying out an Experiment.—The mercury is poured out of the tube B and the rubber tube connecting this with A, and B is then inverted and its open end is immersed in a dish of mercury. The stop cock is then opened, and air is forced through a drying tube and A in a manner similar to that already described. Some mercury is then poured into B so as to seal off the air in A from the damp air of the room. B is replaced in front of the scale S, and mercury introduced until the surface rises to the mark *a*. With the stop-cock still open, and the drying-tube attached to it, but with the pump removed, ice and water are placed in the vessel surrounding A, and these are well stirred for some minutes. The tube B is then carefully adjusted until the mercury exactly rises to the mark *a*, the stop-cock is closed, and the position of the mercury surface in B is read by the aid of the slider. The barometer is read so as to obtain the pressure P of the air at 0° C. Next raise the tube B so that the air in A cannot expand into the rubber connecting tube below *a*, remove the ice and water from the vessel enclosing A, and fill the vessel three parts full with boiling water. Blow steam into this water until the bubbles of steam rise through the water without condensing; then adjust the tube B so that the mercury surface coincides with the mark *a*, and read the position of the mercury surface in B by the aid of the slider. The differ-

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ence between the second and first readings for the mercury surface in B gives p, the increase in pressure which is necessary in order to keep the volume of the air in A constant while the temperature is raised from 0° C. to 100° C.

$$\text{Then pressure coefficient} = \frac{p}{100\text{P}}.$$

Correction for Expansion of the Bulb A.—Owing to the expansion of the bulb during the process of raising its temperature from 0° C. to 100° C., the contained air is not kept at exactly constant volume. Hence the final pressure is too small; for, in order to reduce the air to its original volume, a slightly greater pressure than that observed in the experiment ought to be applied to it. Let V be the volume of the bulb at 0° C.; then at 100° C. its volume will be $\text{V}(1 + 100g)$. The observed pressure is $\text{P} + p$. Let the pressure that would reduce the volume of the gas to its original value, V, be $\text{P} + p'$. Then, by Boyle's law, the product of the pressure and volume of a gas is constant at a constant temperature, which leads to the equation

$$(\text{P} + p)\,\text{V}\,(1 + 100g) = (\text{P} + p')\,\text{V}.$$
$$\therefore (\text{P} + p)\,(1 + 100g) = \text{P} + p'.$$
$$\text{P} + 100g\text{P} + p(1 + 100g) = \text{P} + p'.$$
$$\therefore p' = 100g\text{P} + p(1 + 100g);$$

$$\text{and the corrected pressure coefficient} = \frac{p'}{100\text{P}}$$
$$= g + \frac{p(1 + 100g)}{100\text{P}}.$$

Since p can be accurately observed, the formula should be applied in full.

SOME NEW SCIENTIFIC BOOKS.

CHAPMAN AND HALL, HENRIETTA STREET, LONDON, W.C.

An Introduction to Volumetric Analysis. By A. Jamieson Walker, Ph.D., B.A., and Owen E. Mott, Ph.D. This small book is evidently written for the use of young students in schools, and should prove very useful. There is, however, one serious omission—the students are not taught to calibrate the measuring apparatus they use. Any chemist knows how essential calibration is, even for fairly rough work. Litre flasks as ordinarily sold will generally be found to be inaccurate to the extent of ·1 c.c. to 1· c.c. The percentage error in burettes is even greater, and *all* students, even beginners, should have their attention drawn to this. One of the chief values of quantitative work is to train students to do accurate work and to be exact.

THE CLARENDON PRESS, LONDON AND OXFORD.

The Junior Geography. By Dr. A. J. Herbertson. This is Vol. II. of the Oxford Geographies, and is regional in plan, giving the British Isles the first 90 pages, Europe the next 80, and the remaining continents the last 100 pages. The features that especially commend themselves are the careful explanations (for the book explains *why*), the accuracy of the statements, the wise selection of the really important facts, and the maps. There are more than 150 of these, and they are not to be found in other school books or atlases, being partly taken from the Regions of the World series, and partly original; among these latter the rainfall maps of the continents are unique and most valuable. The book should be useful both in class and as an aid to the teacher's own study of the subject.

T. C. AND E. C. JACK, EDINBURGH AND LONDON.

Meteorology; or, Weather Explained. By J. G. M'Pherson, Ph.D., F.R.S.E., author of *Tales of Science*, etc. (Shilling Scientific series.) If meteorology cannot yet predict what the weather is going to be like, it has at any rate gone some way in the direction of explaining what the weather is, and how it has come to be what it is. This little book is an admirable introduction to scientific ideas of this kind. The writer has taken full advantage of the striking discoveries of Dr. Aitken, which he explains and illustrates in a very clear and helpful manner, and uses for the elucidation of many points regarding the weather which the unscientific observer finds very mysterious. He gives a brightly written and comprehensive summary of a wide subject.

MESSRS. MACMILLAN & CO.

Machine Construction and Drawing. By Frank Castle. Mr. Castle has produced a thoroughly comprehensive work on

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cise work, which will be invaluable to students of machine design. Nothing seems to have been omitted, and the matter is set out in a most workmanlike manner.

The introductory chapter very properly deals with mechanical drawing instruments—compasses, drawing boards, set squares, scales, and the like—and valuable advice is given as to the kind most suitable for engineers' work. This section also deals with the tinting of drawings, with the various sections usually employed to denote different materials, with the freehand sketching of machine details, and with some simple geometrical constructions. The author advises all students to study this section before proceeding with the actual machine drawing. With this advice we are in hearty agreement; much subsequent trouble will be saved if it is carefully followed.

Of the chapters dealing with the practical machine drawing it is impossible to speak too highly. Each section is treated in an exhaustive manner, both in the matter of drawings and letterpress. The author is not merely content with giving examples for students to draw, and explaining their construction and use, but he deals with the mathematical side too, and shows the connection between the practical and the theoretical sides of the subject.

It is not possible within the limits of this notice to deal in anything like detail with the numerous illustrations. There are two hundred and forty-eight, exclusive of those in connection with the examination tests at the end, but a summary of the several sections will serve to show the completeness of the work. They are: rivets and riveted joints; screws, bolts, and nuts; shaftings and couplings; belt and rope pulleys; wheels; bearings; pipes and pipe joints; engine details; stuffing boxes and glands; crossheads and slide bars; connecting rods; cranks and eccentrics; valves; materials; and, lastly, examination tests—a truly comprehensive list.

Throughout the book the drawings are made in a clear, neat, workmanlike manner, and properly dimensioned. Students working intelligently through it could not fail to have a good grasp of the subject. Both matter and method are excellent, and it is certainly one of the very best students' books that has been published on this important subject. We can recommend it with great confidence.

An Introduction to Practical Geography, by A. T. Simmons, B.Sc., and Hugh Richardson, M.A. In few subjects has such improvement in methods of teaching been made as in geography, and if this book is adopted the improvement will be still greater. The writers have no doubt found great difficulty in deciding how much preliminary mathematics, &c., they might assume, but they have erred, if at all, on the right side. The book will do a great deal towards securing a logical and scientific treatment for geography.

RALPH, HOLLAND AND CO., TEMPLE CHAMBERS, LONDON, E.C.

Elementary Science. By J. H. Nancarrow. This is the third "new and enlarged edition" of a volume first published in 1900. It is frankly an examination book, but the net is thrown widely, for the subjects dealt with cover the syllabuses for pupil teachers, scholarship and certificate candidates, the Oxford and Cambridge junior local examinations, and that of the College of Preceptors. The treatment is experimental, direct, clear, and practical. The faults of the volume are those of the examination syllabuses, which it faithfully follows.

UNIVERSITY TUTORIAL PRESS, LTD., DRURY LANE, LONDON, E.C.

First Stage Physiography. Section I. Edited by R. Wallace Stewart, D.Sc. This elementary book has been specially written to meet the requirements of the Board of Education. The various sections have been written by specialists in their own branches under Dr. Stewart's editorship. The result is a very suitable book to place in the hands of students just entering on the study of scientific subjects. Like most of the books in the Organised Science series to which it belongs it is well printed on good paper, and the diagrams are usually clear and good, while the important points in the text are emphasised by being printed in thicker type. At the end of the book answers are given to the numerical exercises. The papers set at the last two Board of Education examinations are also given.

The Editor regrets that, owing to extreme pressure upon space, the remaining portion of the Science Section has been crowded out of this issue.

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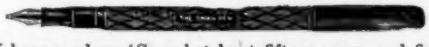

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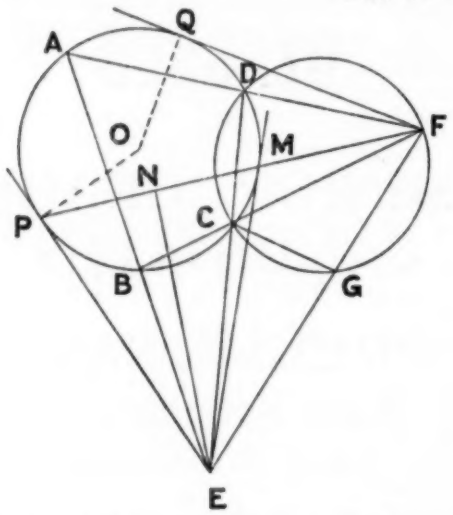
(RULES as in previous issues.)

Linden Avenue.—If a quadrilateral be inscribed in a circle, show that the square on the straight line joining the points of intersection of opposite sides is less than the sum of the squares on the straight lines joining those points to the centre of the circle by twice the square on the radius of the circle.

Hence show that if one pair of opposite sides of a quadrilateral inscribed in a circle intersect at a fixed point, the other pair of opposite sides will intersect on a fixed straight line.

(Stage 3, 1896.)



1. Let ABCD be a quadrilateral inscribed in a circle. Produce the sides AB, DC to meet in E, and AD, BC to meet in F. Join EF. From E, F draw EP, FQ tangents to the circle ABCD. About the triangle CDF draw the circle CDF, cutting EF in G. Join CG.

The angles BAD, BCD are together equal to two right angles (Euclid III. 22), and the angles DFG, DCG are together equal to two right angles. Therefore the angles BAD, BCD, DFG, DCG are together equal to four right angles. But the angles BCD, DCG, GCB are together equal to four right angles. Hence the angle GCB is equal to the sum of the two angles BAD, DFG. To each of these equals add the angle BEG. Therefore the angles GCB, BEG are together equal to the three angles BAD, DFG, GEB. Therefore the angles GCB, BEG are together equal to two right angles. Hence BCGE is a cyclic quadrilateral. Therefore the rectangle EF.FG = the rectangle BF.FC = the square on the tangent FQ. Again, the rectangle FE.EG = the rectangle DE.EC = the square on the tangent EP. But FE.EG + EF.FG = the square on EF (Euclid II. 2). Hence the square on EF is equal to the sum of the squares on the tangents EP, FG. Therefore, if O be the centre of the circle ABCD, the square of EF is less than the sum of the squares on OE, OF by the sum of the squares on the radii OP, OQ.

2. Let E be a fixed point, and EBA, ECD any pair of chords through the point E. Then, with the same construction as in (1), we may prove that $EF^2 = EP^2 + FQ^2$.

Join PF, cutting the circle ABCD in M, and draw EN perpendicular to PF. Then by Euclid II. 13,

$$EF^2 = EP^2 + PF^2 - 2FP.PN.$$

But $EF^2 = EP^2 + FQ^2$.

Therefore $FQ^2 = PF^2 - 2FP.PN$.

But $FQ^2 = PF.FM$.

Therefore $PF.FM = PF^2 - 2FP.PN$.

Hence $FM = PF - 2PN$.

Therefore $2PN = PF - FM = PM$.

Hence PM is bisected at M.

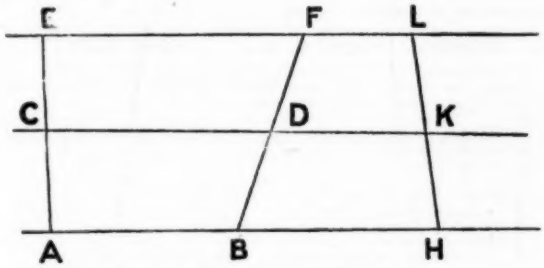
But EN is perpendicular to PM (construction).

Therefore EM is equal to EP (Euclid I. 4).

Hence EM is a tangent to the circle ABCD.

Therefore PF is the polar of E with respect to the circle ABCD. Hence F, the intersection of the sides AD, BC, lies on a fixed straight line.

X.Y.Z.—Three trains, of lengths a, b, c feet, are travelling with uniform velocities, u, v, w feet per second, in the same direction on equidistant parallel rails with their rearmost carriages in a straight line; show that the trains may all be cut by some straight line or other for a time $\frac{a+c}{2v-u-w}$ seconds, or for a time $\frac{2b}{u+w-2v}$ seconds, according as $2v$ is greater or less than $u+w$.



Let t denote the required time in seconds.

Let AB = ut, EF = vt, BH = a, FL = c.

Join BF, HL. Then from the equidistant parallels AH, CK, EL, we have

$$2CD = AB + EF;\ 2CK = AH + EL.$$

So long as t is such that vt is not greater than CK, and $(vt + b)$ is not less than CD, it is obvious that some straight line or other will cut all the trains for a time t.

Taking CK = vt, we have

$$2vt = AH + EL = (ut + a) + (wt + c).$$

$$\text{Hence } t = \frac{a+c}{2v-u-w}.$$

Taking CD = $vt + b$, we have

$$2(vt + b) = AB + EF = ut + wt.$$

$$\text{Hence } t = \frac{2b}{u+w-2v}.$$

A.C.—Give a short discussion regarding the physical condition of aqueous vapour in the air. A flask of dry air and one of water-saturated air are gradually heated, say from 50° C. to 150° C.; what would be the difference in expansion, especially up to 100° C., at 100° C., and above 100° C.?

If water is introduced into a space containing dry air vapour is formed, and it is found by experiment that the pressure and density of the vapour are dependent only on the temperature of the air, and are quite independent of the density of the air, being exactly the same as they would be if water were introduced into the space after the air had been removed.

The effect of a rise of temperature on a saturated vapour depends on whether its liquid is present or not. If vapour be heated in a closed space in contact with its liquid, the liquid is converted into vapour, and the pressure increases in such a way that, at any given temperature, the space is saturated by the vapour, and the pressure exerted is the maximum pressure for that temperature. If, on the other hand, saturated vapour is heated in the absence of its liquid, it expands very nearly in accordance with Gay-Lussac's law—that is, in accordance with the formula

$$\frac{Vt}{V0} = \frac{273+t}{273+t'},$$

where Vt stands for the volume at t degrees Centigrade. But air expands in accordance with this law. Hence, in case of the two flasks, the increase in volume at any temperature above 50° C. will be practically the same in both flasks.

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THE EDITOR'S BOOKSHELF

W. B. CLIVE, LONDON.

Principles and Methods of Teaching. By Professor J. Welton, M.A. The present reviewer confesses to using a private method of testing each new book on teaching. This is to look first at the index in order to find out how often Herbart and Pestalozzi are mentioned, and to form his first opinion accordingly. In the index of this volume the name of Herbart occurs twice only, and that of Pestalozzi once. Consequently the reviewer breathes freely, and settles down to a more or less careful reading of the book itself.

Though Professor Welton's name stands upon the title-page of this volume, the book is not entirely the product of his pen. The chapters on music, geography, mathematics, natural history, and needlework have been prepared by specialists in these respective subjects, so that the teacher who uses this book for examination purposes, or as a handbook of practical school method, will be able to feel that every part of it is the work of an educationist who follows the golden rule—namely, to write "of the little things he knows about."

To apply to such a book as this the stereotyped epithet "suggestive" is to give an inadequate idea of its intrinsic value. We have an official handbook of method, which is suggestivity *in excelsis*. This volume not only suggests new ideas, but it focuses the attention of the reader upon methods of working which can, on the whole, be actually carried out under present conditions. It is this quality of sweet reasonableness which distinguishes Professor Welton's work from the lofty and chilling idealism of the Board of Education. Those teachers who give his book an honoured place among their working implements—and they will be many—can rest assured that, on the whole, the plans suggested are possible plans, given enthusiasm and patience on the part of those who endeavour to carry them out.

The first three chapters treat of the basic principles of teaching in a reasonable manner, and without any of the jargon which so often makes the reading of a book of method an irksome task. Correlation and culture epochs are dealt with in this section, and in a sensible manner, which will prove very acceptable to practical teachers anxious to get the best out of every so-called new theory (Plato was a firm believer in correlation) without becoming its slave. Then follow five excellent chapters on the teaching of English, the backbone of the curriculum of English schools. We have marked in our copy of the volume several passages in these chapters for quotation, but space forbids. The whole series forms a body of doctrine which, when put into practice in all our primary schools, will entirely change the point of view of every pupil who passes through them, to his own permanent advantage. The writer shows throughout the true method of the born teacher. If a principle is stated, the "*e.g.*" invariably follows close upon it.

The remaining chapters deal respectively with music (note the place of this subject), history, geography, natural history, mathematics (the comprehensive title is significant), form (including drawing, handicraft, and school gardens), and needlework. Each chapter is followed by a list of the best books for further study, and the whole are illuminated by well-chosen quotations from a wide range of writers, not only on pedagogy, but also on kindred subjects.

Professor Welton's aim is to help the teacher in his actual work in school. In the opinion of the present reviewer, at least, he has hit the mark well and truly.

WILLIAM BLACKWOOD AND SONS, EDINBURGH AND LONDON.

A New Interpretation of Herbart's Psychology and Educational Theory through the Philosophy of Leibniz. By John Davidson, M.A., D.Phil. (Edin.), Headmaster of the High School, Stranraer, etc.

This is in many ways the most satisfactory treatment of Herbart which we have seen. Educationists are inclined to regard him as a sugge-tive writer on education but a hopeless case as a philosopher, and are sometimes prone to affirm that all his best educational results have been arrived at in spite of his philosophy, and not in accordance with it. In any case, his philosophy does not matter, according to the current views of him. This is not a conclusion which commends itself to a philosophical student, and ought to arouse suspicion as to the insight of those who formulate it. Herbart believed that his philosophy was a consistent whole, and those interpreters who affirm the contrary should present a very strong case before we accept their interpretation.

Dr. Davidson has set himself the task of defending Herbart's consistency as a philosopher and an educationist. He finds the common errors regarding Herbart to arise from a neglect on the part of his expositors to appreciate his metaphysical and psychological standpoint. The key to Herbart is really found in Leibniz; but English writers have never taken Leibniz quite seriously, and thus have failed to understand both Leibniz and Herbart. We congratulate Mr. Davidson heartily on the ability with which he conducts the exposition of the Leibnizian philosophy in so far as it bears on Herbart, and the success with which he uses this key to solve the apparent contradictions with which the latter is commonly charged. The book is one which appeals primarily to readers of somewhat philosophical tastes, but it can be warmly recommended to the many teachers who find in Herbart the inspiration of their best educational ideas. Dr. Davidson's book is not necessary to an understanding of Herbart merely as an educationist; we do consider it essential, however, to those who wish to examine the foundations on which his illuminating educational principles are based. Especially would we recommend it to those who have been taught to believe that the best of Herbart's educational theory is in flat contradiction to, or is at least independent of, his fundamental philosophy.

THE TEACHING OF THE MOTHER TONGUE.

MURRAY.

By far the most important book in this section is Professor H. C. Wyld's **Historical Study of the Mother Tongue.** It is a book for the teacher as a student of his own language, and is deserving of the careful attention of all those who wish to keep their methods of teaching well abreast of the newest thought. It is only the teacher of the highest forms or the English lecturer who can directly profit by the subject-matter of the volume; but the teacher of the most elementary English will gain a newer and better point of view from a careful study of Professor Wyld's scholarly and interesting chapters. The author has also issued, through Mr. Murray, a pamphlet on **The Place of the Mother Tongue in National Education,** in which he gives some idea of the means of applying the scientific method to the study of the native speech. This work is, however, too scanty, too much of a skeleton outline. If the present generation of teachers are to change their methods and their point of view, they must have rather more explicit direction than Professor Wyld affords. He may—indeed we know personally that he does—indicate to his own students the right lines of action, but we cannot all go to Liverpool.

HODDER AND STOUGHTON.

We have also received the bound volumes, two in number, of **The Bookman Illustrated History of English Literature.** By Dr. Robertson Nicoll and Mr. Thomas Seccombe. This book provides interesting and stimulating reading for the student who has a good acquaintance with the works which the authors pass in review, but it lacks that continuity which it is the business of such a student to attempt to trace. The volumes are really a collection of more or less brilliant monographs. We object to the size of the books, which appears to us to serve no good purpose. The illustrations, many of them excellent, would not have suffered by reduction; in fact, some have had to be enlarged from comparatively small originals, with somewhat disastrous results.

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Model Readers Book V. We have favourably noticed the preceding books under this title, and the one at present before us is quite up to the standard. Its lessons are well selected and presented, its illustrations are good, and its binding such as is likely to endure fair wear and tear. Some popular songs with music in both notations are included, and there are some useful grammar and composition lessons added.

Story-Book Readers. This is a series of books issued for the purpose of providing continuous reading lessons for the several standards, the following being intended for V. and VI. :—

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The World of Ice, abridged, Ballantyne.
Claverhouse, from Scott's *Old Mortality*, and
The Tournament, also from Scott's *Ivanhoe*.

Of them all it may be said that the reading matter is suitable, and the books are well issued. There are about ninety pages in each book, bound in a distinguishable red cloth cover. The price is fourpence each.

CLARENDON PRESS, AMEN CORNER, LONDON, E.C.

Pierce the Ploughman's Crede. Edited by Rev. W. W. Skeat. This old English poem is far less widely known than the *Vision of Piers Plowman*, but we venture to think that the popularity of the latter is largely due to the excellent edition of Professor Skeat. The *Crede* is now given to us by the same practised hand. Texts have been carefully collated, and the variations noted; while the introduction and notes are just such as one expects from the editor's scholarly pen.

Old Mortality. By Sir Walter Scott. Edited by H. B. George, M.A. This is a finely-printed and well-bound edition of Scott's well-known novel. The editor has wisely limited himself to a short historical introduction, five pages of notes, and a vocabulary explaining the words which are not familiar to a southerner. These, however, are well done, and will prove real aids to a true appreciation of the book.

Ivanhoe, by Sir Walter Scott, Bart., with illustrations, and **The Talisman,** by Sir Walter Scott, Bart., with illustrations. The popularity of Scott, as judged by the innumerable editions of his works still appearing, is surely waxing rather than waning, and for this evidence of healthy taste in a generation supposed to be wholly given over to scraps and tit-bits one cannot but feel devoutly thankful. These volumes are tastefully and substantially produced, and are very suitable for school libraries. There are numerous and good illustrations, reproduced from fine engravings.

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The inclusion of **Pepys' Diary** in Messrs. Macmillan's excellent Globe Edition is a real boon to the reading public. Almost a century and a half elapsed between the writing and the publication of this book, and although begun in 1659 it is still not out of copyright. The manuscript formed part of the splendid library which Pepys bequeathed to Magdalen College, Cambridge, and up to 1825 it lay on the shelves of the college library unnoted and unheard of. Mr. Samuel Pepys, whom we in our day regard as the social chatterbox of Restoration times, was known before the publication of his Journal as a zealous naval administrator. His capable and earnest work while Secretary to the Admiralty secured him an honourable place in the public memory and in the records of Whitehall. But the fame of his entertaining gossip, when once it came before the world, quite eclipsed his sounder reputation, and posterity knows him only as "the greatest of English diarists." Spite of some indications to the contrary, it is pretty certain that Pepys kept the Diary solely for himself, and had no thought of it ever being made public. His indiscretions and his candour are truly amazing—some indeed so unprintable that no complete text has ever been published. He observed great secrecy over it, keeping the volumes hidden, and always under lock and key; yet "what was intended to be the most private of documents has become one of the great books." Shorthand writing was then fashionable, and Mr. Pepys had a fancy for making different ciphers, which he used for memoranda in his office work. The Diary was thus written in shorthand, and was first deciphered by the Rev. John Smith, who ruined his eyesight in the task. On this translation were based several editions by Lord Braybrooke, the fourth one being the text now given in the Globe Edition, with the corrections of Mr. Mynors Bright, who re-deciphered the manuscript in 1879. The Diary, begun when the author was only twenty-seven years of age, shows a vain, boastful, kind-hearted man; and the froth of small talk, the amusing admissions, the scandalous fidelity with which life in the Merry Monarch's time is depicted, have won an immortal fame for Mr. Pepys far beyond that which he achieved by his good work as a public servant. Professor Gregory Smith has done good service here. His notes are concise and scholarly, and the Introduction is of very high value, awakening the reader's interest and giving such information as greatly enhances the enjoyment of the book. With no superfluous words, there is yet a complete preparation and exposition, worthy of all praise. The book is a model of wise and learned editing, and the public will welcome the appearance of Pepys in one moderately-sized volume. The type is good, despite the large amount of matter between the covers, and it is altogether a thoroughly satisfactory edition.

Macaulay's Essay on Samuel Johnson. The essay is here presented in a very neat and handy form, with a few short notes.

Macaulay's Essay on Sir William Temple. This is a text admirably suited for secondary schools. The historical nature of the subject matter keeps up the interest of the pupil, and induces a liking for the grand English prose in which it is written.

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The Carmelite Classics. Goldsmith, *The Deserted Village*, edited by C. T. Onions, M.A. Lond.; Milton, *L'Allegro and Il Penseroso*, edited by C. L. Thomson, Examiner in English Literature to the Central Welsh Board. The preface explains that "these little books are prepared on a somewhat novel plan. The notes are reduced to a minimum, and refer only to such matters as pupils of school age could not be expected to know or to think out for themselves." The notes to the *Deserted Village* number only eleven. In one of these "plover," without any qualifying expression, is used for "lapwing," which would be somewhat confusing in districts where the names are used for two distinct species. A few questions on the poems are appended.

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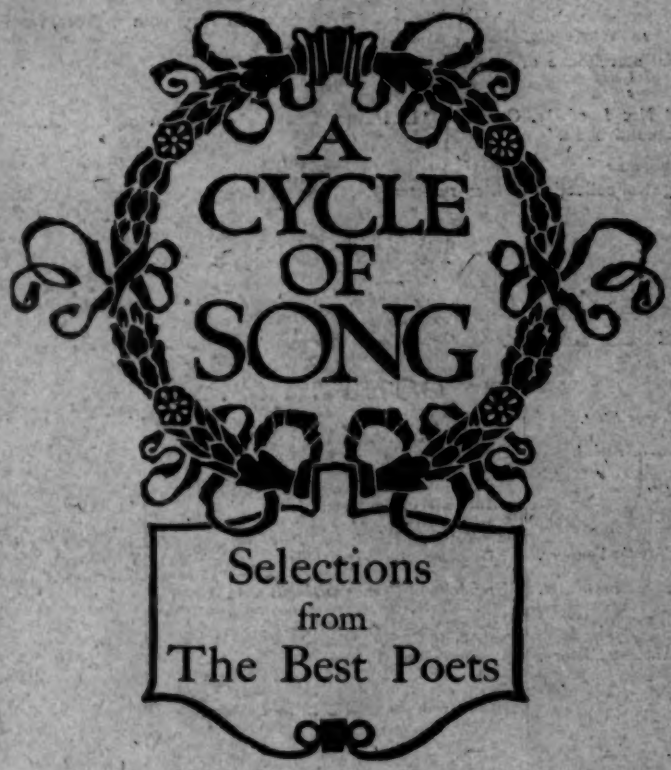
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COUPON
PRACTICAL TEACHER
February 1907

PRINTED AND PUBLISHED BY THOMAS NELSON & SONS, PROPRIETORS, AT THE OFFICE OF "THE PRACTICAL TEACHER," 35 & 36 PATERNOSTER ROW, LONDON, E.C.